

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

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► ATM NETWORKS

MasterCard aims to buy Cirrus net

BY JIM BROWN
New Products Editor

NEW YORK — Trying to outpace archrival Visa USA, Inc. in the automated teller machine market, MasterCard International, Inc. last week renewed its efforts to acquire Cirrus System, Inc., the larg-

est nationwide ATM network.

By acquiring ATM nets, the credit giants are hoping to spur card usage by increasing the number of locations at which customers can get cash advances. Because bank ATM cards are increasingly being used as debit cards, the firms are also hoping to augment reve-

nues by increasing traffic over existing point-of-sale networks.

Last February, Visa acquired an interest in Plus System, Inc., the nation's second largest ATM net, doubling the potential number of locations where Visa cardholders can obtain cash advances and enabling Visa member financial institutions to join a national ATM net.

A merger between the 5-year-old Cirrus and MasterCard would nearly triple the number of locations at which MasterCard holders can get cash advances.

Spokesmen for both Cirrus, based in Downers Grove, Ill., and See page 47

► SUIT SETTLEMENT

Bill woes still haunt US Sprint

Agrees to pay for GTE Sprint errors.

BY PAM POWERS
Senior Editor

KANSAS CITY, Mo. — As part of a proposed out-of-court settlement of a class action suit, US Sprint Communications Co. may have to shell out more than \$4 million in refunds or credits to customers who were billed erroneously for calls placed through GTE Sprint Communications Corp. between 1978 and 1985.

The settlement, which is subject to court approval, stems from a suit filed against GTE Sprint for charges assessed for unanswered telephone calls. It calls for US Sprint to give customers of GTE Sprint and SP Communications Corp. cash refunds or credit for long-distance service.

GTE Sprint was merged with a former United Telecommunications, Inc. communications subsidiary in July 1986 to form US Sprint.

SP Communications, a former subsidiary of Southern Pacific Transportation Co., was acquired See page 6

► OPEN SYSTEMS

LAN vendors vary in support of ISO

BY MARY PETROSKY
West Coast Correspondent

In a push to allow computers from multiple vendors to communicate across local networks, an increasing number of net vendors are committing support to standards specified by the International Standards Organization (ISO).

Commitment to ISO varies widely among makers of local-area networks. Some say they can deliver products today, while others are taking a wait-and-see stance. All agree, however, with ISO's long-term goal: to enable dis-

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NETWORK LINE

News

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► This week's review contrasts protocol converters: Jupiter Technology's System 1000 and Tri-Data's Netway Local Terminal Network. Page 39.

NETWORK SECURITY

Diverse nets are high-risk groups

BY JOHN O'LEARY
Special to Network World

Intricate networks that combine hardware and software from multiple vendors make it possible to increase productivity at all levels of an organization. Such networks make life easier for most people but add complexity to the mission of the already-beleaguered data security officer.

The security issues raised by multivendor networks include such matters as divergent vendor philosophies, component compatibility, security domains and user tolerance. Complexity of administration comes with the territory Continued on page 35

► COST CUTTING

Networks cure hospital ills

BY MICHAEL FAHEY
Senior Writer

Forced to deal with a dramatic drop in revenues, hospitals and health care facilities are looking to their communications managers to implement new networking and information systems to slash costs and provide more efficient services.

The cash crunch for hospitals began in 1983, when Congress, in an attempt to control escalating health care costs, amended the Social Security Act to require federal health insurance programs to pay fixed fees for medical procedures.

Some private insurance carriers followed suit, ending the days when hospitals were reimbursed for medical procedures on a cost-plus basis. In the past, hospitals were reimbursed for all expenses in treating patients and were eligible for a profit or a pre-

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As revenues fall, hospitals turn to networking to pare costs

- On-line order-entry systems increase efficiency and earn hospitals volume discounts from suppliers.
- Electronic links to insurance companies streamline billing and information exchange.
- On-line patient data cuts workloads and increases personnel efficiency.
- Offering remote access to patient information builds doctor loyalty and generates new admissions.

ILLUSTRATION BY NETWORK WORLD

► **FEDERAL GOVERNMENT**

DOD plans multibillion-dollar digital network

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — Officials at the Department of Defense announced plans last week to acquire a multibillion-dollar digital communications network capable of handling voice, data, video and cellular communications for Defense Department facilities in the Washington, D.C. metropolitan area.

The Defense Telecommunications Service of Washington (DTSW) will award two separate contracts over the next two years — one for long-distance telephone services and another for local service and customer premises equipment. DTSW provides communications services to 160,000 end users in Defense Department facilities, including the Pentagon, military bases and other defense-related offices.

The existing DTSW system consists of long-distance WATS service supplied by AT&T and MCI Communications Corp., private lines supplied by AT&T and Bell

Atlantic Corp., local switched Centrex service from Bell Atlantic and customer premises equipment supplied by AT&T. DTSW pays \$65 million a year for local phone service, equipment and maintenance, said Patrick Burke, Telecommunications Modernization Project (TEMPO) manager at DTSW.

The DTSW project coincides with the General Services Administration's (GSA) planned replacement of its Federal Telecommunications System (FTS) with the FTS 2000, which will be an all-digital long-distance network for federal government agencies.

Final bids for the first part of the new Defense Department system, dubbed Direct Dial Long Distance Telephone System (DDLD), were submitted last week. A one-year contract with four one-year renewal options will be awarded in December, and implementation is scheduled to begin 90 days after the award is made.

While the DTSW would not release the names of the bidders, sources said they included AT&T,

MCI, US Sprint Communications Co., ITT Corp. and Western Union Corp.

The DTSW would not release the value of the contract but said it now spends \$8 million annually for long-distance services and expects to lower its long-distance costs as a result of this procurement, according to Michael Thomas, network facilities manager at DTSW. DTSW would not specify how much it expects to save with the new net.

The DDLD request for proposal does not specify any particular types of service but does state that the agency wants 600 access lines, capacity enough for 6 million minutes of traffic per month and the ability to support 4.8K bit/sec data communications.

The second contract, for the TEMPO part of the system, covers local transmission service and customer premises equipment. The DTSW is expected to issue a draft RFP for this contract on Sept. 1. A final RFP will be issued in December, and bids will be due in May 1988. The 10-year contract will be awarded in the spring of 1989, Burke said.

The estimated value of the contract is \$1 billion, and likely bidders include carriers such as the regional Bell holding companies and AT&T, system integrators

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► **CONTRACT CLASH**

AT&T wins Hancock net deal

*Award culminates yearlong battle.***BY BOB WALLACE**

Senior Editor

BOSTON — AT&T fought off furious competition from IBM/Rolm Corp.'s Enterprise Marketing team and elite sales squads from Nynex Corp./New England Telephone & Telegraph Co. and Intecom, Inc./Wang Laboratories, Inc. to capture a bitterly contested \$8 million contract to provide John Hancock Mutual Life Insurance Co. with a city-wide communications network.

The award of the contract two weeks ago marked the end of a 12-month battle for four bidders. John Hancock, one of New England Telephone's oldest and largest analog Centrex users, chose to replace its 5,000- to 6,000-line Centrex system with a private branch exchange-based network. The new network will provide a higher degree of control while reducing the costs of station moves, adds and changes.

Under terms of the deal, AT&T will provide John Hancock with a System 85 PBX equipped with several facilities management tools for its corporate headquarters here, seven remote PBX modules for surrounding sites and the fiber-optic cable needed to link a trio of user sites in Boston's Back Bay.

John Hancock, which has served as a proving ground for AT&T's Premises Distribution System (PDS) cabling scheme, also plans to install PDS in its 60-floor tower here. The insurance company already operates a System 85 with PDS in a second building nearby.

Because of the complexity and detail of the vendor responses to requests for proposal, John Hancock enlisted the assistance of Arthur D. Little, Inc., a communications consulting firm in Cambridge, Mass., to help evaluate the proposals. Each vendor dispatched a crack marketing team, ranging in size from six to 10 people, and support personnel to Boston to present their network proposals.

The marketing teams pulled out all the stops in attempting to land the contract. After the RFP responses were received, members of the insurance company's telecommunications staff were shuttled to the vendors' corporate headquarters and top research and development laboratories. Key vendor executives visited John Hancock's headquarters here to deliver pitches for their system proposals.

According to Stephen Kelley, telecommunications corporate consulting director for John Hancock, all vendors offered access to their top strategic planners and directors of product and service development.

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► **MANAGEMENT STRATEGIES**

Telecom dept. nets profit

BY JOSH GONZE

Staff Writer

BIRMINGHAM, Ala. — Protective Life Insurance Co. recently spun off its telecommunications department to create a revenue-generating subsidiary that could slash the company's annual \$1.2 billion communications budget in half.

ProTelCom, Inc., formerly Protective Life's telecommunications department, was incorporated here on January 1, 1987 to sell communications products and services. The company was also to run Protective Life's nationwide communications network.

Protective Life's first venture outside the life insurance business, ProTelCom, now resells long-distance services, operates a voice-mail service bureau and acts as a distributor of Octel Communications Corp. voice-messaging systems. In addition, it provides shared tenant services, according to Vice-President Jim Johnson, director of telecommunications for the parent company.

ProTelCom resells WATS services from Southern Interexchange Services, Inc. within the state and interstate WATS services provided by SouthernNet, Inc. in the southeast and MCI Communications Corp., US Sprint Communications Co. and AT&T elsewhere.

Reseller benefits realized

When ProTelCom began reselling long-distance toll capacity, the

company realized the benefit of the lower rates that carriers charge resellers.

Averaging across the different carriers, ProTelCom, at the present time, is paying a composite

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► **ENHANCED SERVICES**

Local packet switching a tough sell, BOCs find

BY **KARYL SCOTT**

Washington, D.C. Correspondent

WASHINGTON, D.C. — The regional Bell holding companies are discovering that selling local packet-switching services is a tougher job than they first anticipated, company officials told *Network World* last week.

To date, five of the seven RBHCs have unveiled packet-switching services, and the remainder have said they will do so in the future. Bell Atlantic Corp., the first RBHC to enter the market, offered its customers local packet services beginning last year.

But the RBHC packet services have met with limited acceptance for a number of reasons. The carriers are only allowed to provide packet service within local access and transport areas, which narrows the range of customers interested in the offerings.

Also, most of the carriers offer packet service only in portions of their regions, and not all provide protocol-conversion capabilities needed by users. In addition, some RBHCs had problems getting tar-

iffs for packet services approved by state and federal regulators.

The RBHCs have also struggled to target appropriate customers for their limited services and have had to build an understanding of packet services among salespeople.

"Packet services have been a slow sell for the RBHCs, due to less-than-effective marketing strategies," said Mark Winther, director of communications services at Link Resources Corp. in New York. "The RBHCs don't know how to sell packet switching. It's a new type of service for them, and they haven't always been able to convince users of the benefits."

Sally Celmer, staff manager for special services at Bell Atlantic, concurred. "We're coming to realize that the selling cycle for data service is fairly long. The marketing effort has required the education of our sales force as well as potential customers," she said.

Many of the RBHCs have targeted small business customers, who tend to be unfamiliar with packet services, and users in certain industry segments that rely heavily on private lines. Bell Atlantic, for

example, has focused on financial service firms, where telecommunications managers are reluctant to put important financial data on the public-switched network.

"We have to convince the telecom manager that his traffic is safe on a packet network," Celmer said.

Bell Atlantic is farthest along in the marketing of local data services throughout its operating region. The company is offering packet switching with protocol conversion in New Jersey, Virginia, Maryland, Pennsylvania and Delaware. It has 35 customers and expects to earn \$1 million in revenue from packet services by the end of this year.

Other RBHCs have not been as aggressive in the deployment of intra-LATA data services, according to a June report issued by Link Resources and titled "Local Packet Networks."

Pacific Telesis Group and US West, Inc. are not offering any type of packet service, although they have plans to do so at some future date. Ameritech and Nynex Corp. are marketing packet services without protocol conversion, but the services are not available throughout their regions. Bell-South Corp. and Southwestern Bell Corp. offer packet switching and protocol conversion in parts of their regions.

Market availability of local

packet services has been hampered by regulatory delays. For example, regulatory roadblocks have prevented Nynex from offering protocol conversion and a data-over-voice feature that allows an ordinary telephone line to be multiplexed into two separate channels, one for voice and the other for data.

"New York Telephone [Co.] hasn't received regulatory approval to offer protocol conversion or data-over-voice, which has limited our market acceptance," said New York Telephone's associate marketing director, Otto Rosenberger. New York Telephone has five customers using packet switching on a trial basis, he said.

Under divestiture rules, the RBHCs can offer intra-LATA service only. The limited geographic scope of RBHC packet services has hurt their market acceptance, said Lee Selwyn, president of Economics and Technology, Inc., a telecommunications consulting firm based in Boston. "If a customer needs nationwide access, he would turn to a national provider like Telenet [Communications Corp.] or Tymnet [McDonnell Douglas Network Systems Co.]"

"But for a customer who only needs to send data between offices in a metropolitan region, the RBHC service is probably more economical than a [value-added network provider]," Selwyn said. ▮

► **DATA COMMUNICATIONS**

AST debuts E-net card

Company expanding its market reach.

BY **MARY PETROSKY**

West Coast Correspondent

IRVINE, Calif. — As part of an increased emphasis on data communications, AST Research, Inc., traditionally a vendor of personal computer add-on equipment such as memory boards and disk subsystems, has introduced its first Ethernet interface board.

According to the company, the AST-Ethernet Adapter will be the fastest network adapter on the market for Novell, Inc.'s NetWare-based networks. The board will be introduced at PC Expo, a New York microcomputer industry trade show beginning Sept. 1. AST markets Advanced NetWare.

The company also recently introduced two new 3270 terminal-emulation products, AST-CoaxIIA for the IBM Personal System/2 line and AST-CoaxII for the IBM Personal Computer XT, AT and compatibles. Both boards can be configured through firmware to support instruction sets for 3270 emulation from IBM, Digital Communications Associates, Inc. or AST. They are available in single-session, multiple-session or graphics terminal-emulation versions.

AST's aggressive new strategy includes plans to introduce a slew of communications products over the next six to nine months, according to Diana LaTour, senior

director of data communications.

The company intends to follow up the Ethernet interface announcement with the introduction of a Token-Ring Network interface board and to follow that with the introduction of board-level support for IBM's Document Interchange Architecture, Document Content Architecture and Advanced Program-to-Program Communications.

At the same time, AST plans to introduce an X.25 gateway for local networks and support for the Department of Defense's Transmission Control Protocol/Internet Protocol.

La Tour said AST would also offer a local network gateway that supports T-1 1.544M bit/sec speeds, as well as a personal computer-based facsimile product. "We want to be known as the connectivity company," La Tour said. "We'll take a PC as the platform and make it do anything."

AST already sells a number of local-area networking and terminal-emulation products. Current network offerings include Starlan and a 5M bit/sec proprietary network called AST Resource Sharing Network. The company also has IBM 3270, IBM 5250 and Digital Equipment Corp. terminal-emulation products.

Traditionally a provider of board-level microcomputer prod-

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► NETWORK MANAGEMENT

DEC, AT&T, Codex to open net control tools

Announcements will reveal strategies.

BY PAUL KORZENIOWSKI
Senior Editor

The ante in the network management game is expected to rise dramatically in the next few weeks as heavy hitters Digital Equipment Corp., AT&T and Codex Corp. announce plans to open their network management products to other vendors' equipment.

The firms, none of which would comment on the announcements, are expected to provide specifications that allow other suppliers to interface their products to the companies' net management systems. By opening up their systems, the vendors will enable users to manage and control an entire network through a single net management system. Currently, most networks are controlled by a variety of autonomous network management tools.

The expected announcements mirror IBM's moves in the integrated net management system market. IBM has provided information to other vendors that allows them to link their net management products to NetView, Big Blue's host-based net management system, through NetView/PC. Support for NetView/PC has not been announced by AT&T, Codex or DEC.

At DECworld, a product show to be held in Boston next month, DEC is expected to announce plans to publish specifications that will help vendors link their network management systems to DEC's line of net management products. The net management announcement is part of an effort to open up DEC's net model, DECnet, so it can more easily support and control multi-vendor voice and data networks.

Analysts also expect DEC to announce an OEM agreement with a data communications supplier and a new release of DECnet, which can support Integrated Services Digital Networks naming services.

AT&T's announcement could come the first week in September. Michael Dortch, senior analyst at the San Francisco office of market research firm The Yankee Group, said he expects AT&T to leverage its voice network management capabilities. The company's current T-1 network management system, AT&T Dataphone II Acculink Network Manager, can control a variety of AT&T voice services. AT&T will broaden that system by revealing specifications that allow suppliers of voice net control tools to link their products to AT&T's system.

Codex has scheduled its new product announcement for Sept. 15. Analysts expect the company to unveil a high-end net management system that will control the company's modems and multiplexers. Customers must now purchase

different net management systems to control different types of Codex equipment. The company is also expected to publish specifications that will enable other vendors' equipment to exchange information with the new system.

The new system will support more lines than the current top-of-the-line 4860 net management system, which supports 744 lines. Analysts report that Codex is developing expert system network management capabilities, which would automate a number of tasks now handled manually. Some of these capabilities may be included in the announcement next month.

AT&T, Codex and DEC are among the growing number of vendors entering the integrated net control system market. In June, Timeplex, Inc. unveiled its Unified Network Management System (UNMS), a network management system that runs on a Hewlett-Packard Co. minicomputer. Timeplex plans to publish specifications so other vendors can integrate their systems with UNMS.

Digital Communications Associates, Inc. and US West Network Systems, Inc. intend to develop

comprehensive network management systems based on the International Standards Organization's Open Systems Interconnect model. Network Equipment Technologies, Inc. (NET) also plans to integrate other vendors' equipment with its network management system. Timeplex, DCA and NET also plan to develop an implementation of NetView/PC.

The widening options will force other vendors to make choices. "Vendors can afford to develop interfaces to only two or maybe three network management systems," said Mark LaRow, group manager at Network Strategies, Inc., a Fairfax, Va., consulting firm.

Gerald Mayfield, president at the Stamford, Conn., office of the DMW Group, Inc., said vendors will choose suppliers with the largest market share. He said IBM is well ahead of the rest of the pack in the network management race since more than 25 vendors have already announced intentions to link their network management systems to NetView.

Despite such support, Jack Freeman, senior analyst at The Yankee Group, said he thinks backbone network suppliers, such as Timeplex and NET, are better positioned to supply integrated network management systems. "Users are looking to control the network, not the hardware connected to the network," he said, adding that NetView cannot adequately control a backbone network. □

► INTERNATIONAL PRIVATE NETWORK

Toyota to link U.S. and Japan facilities via T-1

BY KARYL SCOTT
Washington, D.C. Correspondent

GEORGETOWN, Ky. — Toyota Motor Corp. is building an auto manufacturing plant here, its first in the U.S., that will also serve as one of two network hubs for a planned international private network linking domestic manufacturing and sales offices with corporate headquarters in Japan.

The need for the international, T-1-based, Electronic Tandem Network is being driven by the high cost of international long-distance service, according to Al Rees, telecommunications manager for Toyota Motor Sales Corp. in Torrance, Calif.

When completed in November, the network will connect Toyota's Japanese headquarters with the new U.S. manufacturing division here, existing U.S. sales headquarters in Torrance, regional sales offices around the country and regional credit offices, which provide buyers with automobile financing.

The network backbone will employ AT&T T-1 transmission facilities for both domestic and international voice, data and facsimile transmission. It is unclear whether

Toyota will retain the digital, satellite-based 56K bit/sec Intelsat Business Service it currently uses for international data transmission.

The network will have two primary switching nodes, one here and the other in Torrance, that will route all incoming and outgoing international calls and switch a large portion of domestic long-distance traffic.

Initially, the network will carry voice and facsimile traffic. Sometime next year, data support will be added for transmission of sales, financial, inventory and parts information between the U.S. and Japan. The manufacturing unit here may eventually use the network to send complex engineering drawings and design information.

The Torrance and Georgetown hubs will employ Northern Telecom, Inc. SL-1 XT private branch exchanges. The switches will be used exclusively for voice, and separate multiplexers will be acquired for data support, Rees said. The multiplexers have not been purchased yet, although they are likely to be Japanese, given the need for compatibility with communications systems in Japan, he said.

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► IEEE STANDARDS

802.3 meet cut short

Vendors mum on twisted-pair net plan.

BY MARY PETROSKY

West Coast Correspondent

SANTA CLARA, Calif. — A preliminary meeting on an IEEE standard for Ethernet-type networks over twisted-pair wiring was cut short when it became clear that vendors attending the meeting here were more interested in learning how other companies are approaching the problem than in revealing their own strategies.

According to Bill Kind, an engineer with Hewlett-Packard Co.'s Roseville Networks Division in Roseville, Calif., more than 50 attendees from more than 20 vendor companies gathered to discuss the feasibility of creating an 802.3 standard for 10M bit/sec transmission over telephone wiring. The IEEE's 802.3 standards describe Ethernet-type networks.

The meeting, which was sponsored by HP, was originally scheduled to last two days but ended after the first day because few vendors had information to share. Some vendors are working on their own implementations of the technology and were reluctant to join the discussion, attendees said. However, the vendors were in agreement that such a standard should be developed.

AT&T, Digital Equipment Corp., Unisys Corp., Wang Laboratories, Inc. and Ungermann-Bass, Inc., along with a number of semiconductor manufacturers, were among the vendors represented at the meeting of the so-called study group. The study group was formed in July during a meeting of the full 802 committee, which is responsible for a range of standards, including local networking standards, HP's Kind said.

The formation of a study group is the first step in the creation of an 802 standard. The group is responsible for developing a proposal, which would be presented to the 802.3 committee, which votes on whether to approve the proposal. If the vote is positive, a task force is formed to develop the specification. If the specification is adopted, it becomes a standard.

The study group is scheduled to meet again in October. If the group meets steadily, it could hammer out a proposal in time for an 802.3 plenary meeting in the spring, Kind said. Typically, standards activities take three years or more to go from initial activity to adoption, attendees said.

The timing is right for the formation of a study group on Ethernet-over-twisted pair, according to Glenn Goldberg, who attended the meeting. Goldberg is a product marketing manager for 3Com Corp. 3Com and SynOptics Communications, Inc., which also sent representatives to the meeting, have developed technologies for supporting 10M bit/sec Ethernet-type nets over twisted-pair wiring.

"We've reset market expectations — people would like to use a common wiring scheme for multiple purposes," Goldberg said.

He pointed out that the attraction of using telephone wiring was highlighted when the group formulated the 1BASE5 standard for Starlan-type nets, which work over telephone wiring in a star topology. If the 802.3 standard is extended to include Ethernet speeds over telephone wire, sales of the 1M bit/sec Starlan could be affect-

ed, Goldberg said.

Currently, the 10M bit/sec versions of the 802.3 standard specify the use of thick (10BASE5) or thin (10BASE2) coaxial cable. Another 802.3 group is in the process of specifying standards for use of fiber-optic cable, said Ron Schmidt, senior vice-president and chief technical officer at SynOptics.

HP was among the few organizations to give a presentation during the recent meeting, Kind said. HP presented a proposal that Ethernet speeds over twisted pair could be achieved by adding a new media-access unit to the existing 802.3 standard, Kind said. HP has already done some testing of 10M bit/sec transmission over non-shielded twisted-pair wiring and

presented its findings to the study group, Kind said.

"The testing we've done on the media shows that it's very feasible technically and can also be done at a reasonable price," Kind said. "Right now, we see 100-meter distances as realistic," he added.

SynOptics also presented information in support of the technical feasibility of a 10M bit/sec transmission speed over twisted-pair wiring, Schmidt said.

However, it is unlikely vendors will wait for standards to appear before introducing products that provide Ethernet speeds over telephone wiring. According to 3Com's Goldberg, "There will be products shipping for some time before there are standards." □

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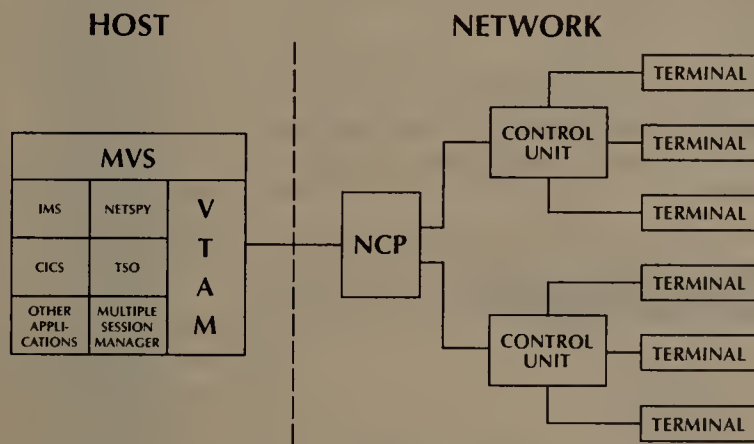
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Bill woes haunt US Sprint

continued from page 1

by GTE Sprint in 1982.

The settlement, proposed in June, could actually benefit US Sprint because, in order to receive free service, claimants would have to subscribe to US Sprint and may then remain as paying customers. But the settlement also adds to the carrier's own billing-related woes. In July, US Sprint wrote off \$76 million in uncollectible bills.

US Sprint's maximum liability under the settlement is the equivalent of 15 million minutes of traffic, although the actual amount disbursed by the carrier will depend on how many of GTE Sprint's approximately 200,000 customers come forward.

The class action suit was filed by Vernon Belon in an Illinois county court. Belon alleged that GTE Sprint charged customers for uncompleted calls without informing them that such charges might be imposed.

The court is expected to rule on the proposed settlement on Jan. 7, 1988.

US Sprint said in a prepared statement that the company "agreed to a settlement to avoid a protracted legal process and to provide the most equitable and timely results for all potential claimants," but denied any violation of law. The company had, and continues to have "specific policies to credit or refund all legitimate claims for unanswered calls," according to the statement.

As required by law, a notice of the proposed settlement has been published in national periodicals such as *The Wall Street Journal* and *USA Today*. The notices alert former GTE Sprint customers to their rights and explain how to file a claim for a credit, or in some cases, a cash refund.

The total number of claims is not to exceed 14 million minutes of calls valued at 21 cents per minute, in addition to another one million minutes valued at varying amounts, according to individual claims.

Mike Furtney, a spokesman for US Sprint, said he could not estimate the number of former customers who will claim refunds.

"US Sprint is betting that very few occasional customers will go to the trouble to make a claim, but this could be a big deal for some business customers," said Robert Ellis, president of The Aries Group, Inc. in Rockville, Md. He agreed, however, that it would be impossible

"US Sprint is betting that few occasional customers will make a claim, but it could be a big deal for business customers."

to predict the final number of claims.

A source close to US Sprint who requested anonymity said, "I expect that most of those 14 million minutes will be claimed. I think US Sprint will be deluged with large business claimants."

US Sprint and other AT&T competitors have long suffered from billing problems because local exchange carriers could not

provide new long-haul carriers with the call supervision data traditionally provided to AT&T. In lieu of that data, US Sprint and others developed billing systems that presumed calls were in process after a designated waiting period, whether or not the call had actually been answered.

With the move to equal access, AT&T's competitors gained access to answer-supervision facilities. However,

they are still in the process of integrating that capability into their existing billing systems, an expensive and difficult task.

Because of those obstacles, Ellis said the Federal Communications Commission and state public utilities commissions (PUC) have been reluctant to punish alternative carriers for erroneously billing customers.

But at least one state

agency, the California PUC, has said it wants to crack down on erroneous billing. The PUC has proposed that carriers not be allowed to bill for calls of less than one minute until they prove billing accuracy ("Carriers decry proposed California billing limits," NW, June 22).

Furtney claimed that US Sprint now has about a 95% accuracy rate in billing for unanswered calls. "While we don't yet have answer supervision in all locations, equal access has brought the capability to many more locations, and we have added our own software enhancements to better capture those calls," he said.

US Sprint's newly gained billing accuracy may now play a large role in turning a bad situation into a big opportunity. The company hopes former GTE Sprint subscribers who have since migrated to other carriers will opt to take call credits rather than cash refunds.

That means they would have to resubscribe to US Sprint, without charge, to obtain their free calls. □

DOD plans digital net

continued from page 2

such as Electronic Data Systems Corp. and equipment vendors such as Rolm Corp.

The TEMPO contract will require a single-source supplier to provide the design, engineering, construction, installation, support and maintenance, although DTSW expects subcontractors to be involved, given the diverse nature of the project, said Leonard Hylton, TEMPO contract specialist.

The Defense Department's decision to replace its existing telecommunications system was prompted by deregulation, competition and declining costs, according to Hylton. "The

competitive climate in the industry made us decide to replace our current system. Our objective is to get the most up-to-date system available and to end up paying less for transmission services," he said.

The Defense Department does not use FTS and does not plan to participate in FTS 2000. "We think we can get a better deal on our own," Thomas said. DTSW currently charges users an average of 19 cents per minute of use for long-distance calls, Burke said, and added, "That's fairly cheap, and we hope to do better under the new contract."

Industry observers agreed with the DTSW's reasoning, noting that the Defense Department will be able to avoid FTS 2000

overhead costs, which the GSA will charge user agencies for upkeep of the massive nationwide network.

"DTSW will actually have better economies of scale than FTS 2000 because its traffic will all be concentrated in the Washington, D.C. area," said Robert Ellis, president of The Aries Group, Inc., a consulting firm in Rockville, Md.

Under the TEMPO project, DTSW hopes to replace its Centrex service with in-house private branch exchanges "that will give our customers some new, enhanced features such as voice messaging, electronic mail, and call holding and forwarding. The TEMPO RFP will also specify features such as Integrated Services Digital Networks and Common Channel Signaling," Burke said.

Defense Department-specified security features will be required for both local and long-distance communications. The new network will interface with other Defense Department and government networks such as the Autovon international network and the nationwide Defense Commercial Telecommunications Network, Burke said.

The contractor will also be responsible for all subsequent customer requests for site surveys, training, documentation, systems software and billing. □

AST debuts E-net card

continued from page 3

ucts, the company's new strategy calls for an emphasis on systems based on industry standards, La Tour said. As a result, AST is now in the process of bundling its hardware and software to make a network starter kit. The kit will include AST's IBM Personal Computer AT-compatible, the Premium 286, configured as a server with AST Advanced NetWare.

This fall, AST will introduce a new version of AST Advanced NetWare, La Tour said. It will incorporate a menu-driven front end designed to make AST's version of the Novell network operating system easier to use.

A key part of AST's strategy is to provide connectivity between IBM, DEC and Apple Computer, Inc. environments, La Tour said. AST is already developing products for DEC and Apple systems, she noted. AST will offer Ethernet support for the Apple Macintosh II soon, in addition to IBM 3270 and 5250 terminal emulation for it.

The AST-Ethernet Adapter, priced at \$595, will be available in October for the IBM Personal Computer, XT, AT and compatibles and the IBM Personal System/2 Model 30s. A micro-channel version compatible

with the rest of the Personal System/2 line will be available in November. The card offers both 8- and 16-bit operation.

The network card is 20% to 30% faster than other Ethernet cards on the market, according to Daniel Sheppard, manager of data communications marketing. This performance gain is partly because the card uses a technique called shared memory, whereby a small portion of a micro's memory is used to store network information, rather than the card talking directly to the micro's bus.

Through a programmable chip set, AST's new 3270-emulation products give users the option to run either AST's, IBM's or DCA's emulation software, said Russell Hertzberg, data communications marketing manager for AST.

The new version of AST's emulation software also allows personal computers to print host files directly to a personal computer printer. The single-session products, AST-3270/Coax-II CUT and CoaxIIA-CUT, will be available in October for \$895. The multiple-session products, AST-3270/CoaxII-DFT and CoaxIIA-DFT, will be available in December for \$1,290. The graphics version of the emulation products, AST-3270/CoaxII-G and CoaxIIA-G, will cost \$1,595. □

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► INFORMATION SERVICES

Vendor trio to offer gateway to data bases

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — Ameritech, Telenet Communications Corp. and Bell Canada Enterprises, Inc. are expected to announce this week the formation of a joint venture called iNet America to market an information service gateway to users in the U.S.

iNet America will provide users with access to a variety of public and private data base services through a common gateway using the public telephone network, a Bell Canada official said.

iNet America is an outgrowth of the 2-year-old Canadian iNet service developed by Bell Canada and marketed by Telecom Canada. iNet has 20,000 subscribers.

iNet subscribers dial into a host processor to access a menu of data base services. The host then routes

calls to the selected services.

Under terms of the venture, Ameritech will own a 15% interest in iNet America. Neither Bell Canada nor Telenet would discuss the terms of its participation.

Telenet will provide data communications, facilities management and related services for iNet. Users in the U.S. will access the iNet gateway through Telenet's packet switching. iNet users will be able to exchange electronic mail over the Telenet network with other iNet users, Telenet Telemail users and telex customers.

Ameritech will market the iNet service within its operating region. It will also interconnect its local packet network with iNet, a spokesman said.

Ameritech's participation in the venture is subject to approval by U.S. District Court Judge Harold Greene. □

Telecom dept. nets profit

continued from page 2

rate of 19 cents per min., compared to the 26 cents per min. that Protective Life's communications department used to pay for the same service.

ProTelCom's rates are competitive with other interexchange carriers, according to Johnson. "For companies within the metropolitan area of Birmingham, we are cost-effective," he said.

Mike Corington, branch manager at South Central Bell Advanced Systems, based here, backed Johnson up, calling ProTelCom's rates "very competitive." The company is using ProTelCom's services for all outbound calls.

After 12 months of service, expected revenue from long-distance resale is \$60,000 per month.

Johnson said the company also anticipates reselling data network capacity and, eventually, offering Integrated Services Digital Network-type voice and data services.

Protective Life's experience with voice mail began with the 1984 purchase of an Octel Aspen, which was used to limit reliance on inbound WATS service by reducing telephone tag between field managers and headquarters personnel, Johnson said.

A natural

Offering voice mailboxes to other companies was "a natural for us because we could do the training," he said of the decision to create a voice-mail service bureau. The first mailbox leases were signed in January. By January 1988, revenue from the sale of voice-mail services is expected to total \$25,000 per month.

The company's success with Aspen led Johnson to approach Octel officials at the International Com-

munications Association conference last June about becoming a distributor. "We convinced them based on our experience with their product and our willingness to migrate service bureau customers to their own equipment. Octel saw it as a win-win situation," he said.

Another win-win situation

Shared tenant services may present ProTelCom with its own win-win situation. Although others have had a difficult time making shared tenant services work, it is attractive to ProTelCom because the company has an Intecom, Inc. S/80 PBX that can be upgraded to support 16,000 ports. "We have the switch capacity and long-distance vendors that will allow us to resell their capacity through our switch, so it was a natural," he explained.

ProTelCom intends to provide tenants within its office park with services and equipment, including station moves, adds and changes and local network support.

Johnson had to jump two hurdles before setting up the new company: He had to get permission from Protective Life's senior management and obtain proper certification from the Alabama Public Service Commission.

Johnson argued to management that, after three years of continuously decreasing telecommunications costs, it would be difficult to reduce costs much more. He also argued that it made good business sense to be a telecommunications services company, given the industry changes that resulted from the divestiture of AT&T.

Johnson attributes final success for the project's approval to low start-up costs. "If we were to look at it from a pure start-up standpoint," Johnson said, "the operating cost coupled with the capital outlay would be prohibitive." □

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AT&T wins Hancock deal

continued from page 2

opment. Kelley said all vendor presentations were both elaborate and detailed but that he was especially impressed with the IBM/Rolm Enterprise Marketing pitch. "The IBM/Rolm presentation was exceptionally professional. They identified and addressed some system shortcomings that

hadn't been addressed in the RFP," he explained. "I was astounded by the resources they made available to us."

Kelley said the IBM/Rolm marketing force consisted of a core group of 10 to 12 individuals and a support staff of another dozen people. AT&T and Inte-

com/Wang committed marketing forces of equal size, while the Nynex/New England Telephone team was slightly smaller, he said.

"There is no simple reason why we chose AT&T," Kelley explained. "We constructed a matrix, and we measured each vendor and the system they proposed. Then we added up all the points to determine how each system had done. Ar-

thur D. Little, [Inc.] and my staff chose the system that we thought would best meet John Hancock's needs," Kelley said. He would not say what criteria were used to rate the vendors and their proposals.

John Hancock selected a PBX-based system because it felt such a system would accommodate the fast-growing and constantly changing corporation's

telecommunications needs better than Centrex. "There are risks involved with using a Centrex-type service provided by the Bell operating company," Kelley said.

"To New England Telephone, John Hancock is only one of many service users. It's up to New England Telephone, not the user, when new Centrex features will be introduced," Kelley added. "If we asked for a particular feature, the BOC could say, 'A preponderance of Centrex users don't need that feature, so you are going to have to wait.'"

Kelley said a second reason for John Hancock's decision to forsake Centrex for a PBX-based net was to reduce the cost of relocating station equipment. "John Hancock is undergoing so much reorganization and change," he said. "New England Telephone proposed digital Centrex service that offered some limited control capability, but it wasn't as much as we needed."

The AT&T Communications System Management PBX software acquired with the System 85 is supposed to reduce the expense of station changes, Kelley said. "We were paying anywhere from \$100 to \$1,000 for each station move, add or change. We hope to reduce that to \$40 to \$100."

He said moving two telephone stations from John Hancock headquarters to its nearby Berkeley Street building had cost the company roughly \$2,000. Kelley also said the 1A2 key telephone station equipment used with its Centrex service was inflexible and difficult to reconfigure.

The System 85 slated for installation in the company's headquarters will use Release 2, Version 4 of the System 85 software. Several AT&T 3B2 computers, serving as adjunct processors, will support advanced automatic call distribution (ACD) systems that use a far larger number of call-routing parameters than other ACDs, have more features and enable users to program how incoming calls are answered. The processors will also support collection of call-detail recording data and the creation of a corporationwide electronic phone number directory.

"We plan to send some members of our telecommunications staff to Unix school so they will eventually be able to write software for custom PBX applications," Kelley said. □



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INDUSTRY UPDATE

“Higher depreciation expenses [for the regional Bell holding companies] will suppress current earnings per share, which were rapidly approaching the authorized rate-of-return levels in many states. Since depreciation expense is included in the rate-making process, higher depreciation expense lowers reported earnings and prevents the reporting of excessive rate-of-return levels. Thus, higher depreciation levels essentially help the RBHCs circumvent the rate-of-return cap.

From “Equity Research”
Dean Witter Reynolds, Inc.
New York

Private branch exchange market installed base projections

	1986	1987	1990	1986-1990 CAGR
Bell operating companies				
Stations (in thousands)	1,305	1,993	5,067	
Growth (percentage)	73.1%	52.7%	29.4%	40.4%
Share (percentage)	5.3%	7.6%	15.9%	
Independent operating companies				
Stations	2,875	2,940	3,075	
Growth	2.5%	2.3%	1.4%	1.7%
Share	11.7%	11.2%	9.7%	
AT&T				
Stations	9,393	9,475	10,268	
Growth	(1.4%)	0.9%	3.4%	2.3%
Share	38.2%	36.1%	32.3%	
Interconnect vendors				
Stations	11,008	11,817	13,393	
Growth	9.1%	7.4%	3.3%	5.0%
Share	44.8%	45.1%	42.1%	
Total				
Stations	24,581	26,225	31,803	
Growth	6.1%	6.7%	6.5%	6.7%
PBX systems				
Average stations per system	223.5	237.3	287.6	6.5%
	110	110.5	110.6	

CAGR = Compound annual growth rate

SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

COMMUNICATIONS STRATEGIES

Users profit in role as vendors

Firms taking their products to market.

BY PAUL KORZENIOWSKI
Senior Editor

A handful of the nation's largest corporations are trying to transform communications from a cost center to a profit center by selling internally developed products.

Eastman Kodak, Inc., The Travelers Co. and AMR Corp., which is the parent company of American Airlines, Inc., recently formed independent business units to sell software and training services developed for their own use. Besides the obvious benefit of recapturing development costs, this practice raises the status of the communica-

tions department within each company by adding to the bottom line and helping the company to diversify.

Eastman Kodak ventured into the software business 11 years ago when the company began searching for network software to support communications among 20 worldwide locations, many of which housed different types of computers. At that time, data was generally transferred among the locations by overnight mail, and often, required information located in one computer had to be rekeyed into a second computer. Customers' See page 10

MFJ ISSUES

AT&T assails BOC FTS 2000 plans

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — AT&T filed comments with U.S. District Court Judge Harold Greene last week, renewing its attack on Bell operating company plans to perform interexchange switching for Martin Marietta Corp. in its bid for the Federal Telecommunications System 2000 (FTS) contract.

AT&T also argued against the Department of Justice's recent recommendation to Greene that the BOCs be allowed to provide interexchange switching, sorting and routing. AT&T and Martin Marietta are competitors for the \$4.5 billion FTS 2000 federal government network contract.

Charges of violating the Modified Final Judgment

AT&T reiterated its earlier argument that BOC provision of interexchange switching constitutes a violation of the Modified Final Judgment, which prohibits the BOCs from selling long-distance services.

AT&T first raised the issue of a possible Modified Final Judgment violation in a July 17 emergency petition filed with Greene. Greene is expected to release his decision by the Aug. 31 deadline for FTS 2000 bids.

AT&T claimed in last week's filing that the BOCs will switch calls directly onto long-distance circuits and route calls all the way to the local access and transport areas in which the calls terminate under the Martin Marietta plan for FTS 2000. AT&T said Martin Marietta will use this type of BOC-provided switching "in lieu of obtaining these switching functions from long-distance carriers."

Two weeks ago, the Justice Department urged Greene to allow the BOCs to provide this type of private network switching for the federal government. The Justice Department is responsible for investigating petitions filed with Greene.

See page 10

INDUSTRY EYE

PAM POWERS

The regulatory colander

A quick look at recent waiver statistics suggests that, given the court's piecemeal deregulation of the regional Bell holding companies, it might be preferable to grant the RBHCs blanket freedom to participate in unregulated markets.

RBHC deregulation, in a perfect world, should only be granted when it can be demonstrated that these companies do not have a competitive advantage in the marketplace.

In fact, the RBHCs still often have that advantage because, despite the existence of some competition in the local exchange, the RBHCs still retain a monopolistic stranglehold on the local loop.

But that almost seems peripheral to the issue, now that the courts have granted the RBHCs 111 waivers to participate in areas officially prohibited by the Modified Final Judgment. Of the requested waivers, a mere 28 have been refused.

And every RBHC — with the exception of Ameritech, which has not requested a software waiver — has applied for at least one waiver in each of the following markets, as delineated by the courts: office equipment, computer sales and electronics; software; billing services; marketing and advertising; securities, insurance and real estate; paging and cellular; foreign ventures and consulting; and training and technology.

What is at work here is a simple

law of fair play dictating that if you let one RBHC into a market from which it was previously forbidden, you must open the floodgates to the rest. It could therefore be said that the imprint of deregulation is already clearly stamped on the RBHCs, and any formal rulings still pending by the courts will be gravy.

There are exceptions to that, of course. The courts still balk at the thought of allowing the RBHCs into long distance, and the RBHCs probably know their regulatory limitations — what remains of them — and avoid venturing into areas that would still constitute a flagrant violation of the Modified Final Judgment.

But permissiveness eventually breeds contempt for existing law. And in the current climate, it's axiomatic that the RBHCs will continue to strain beyond the limits of the Modified Final Judgment.

Given that scenario, maybe it makes more sense to grant the RBHCs their freedom and impose the necessary strictures along with that freedom in a consistent fashion.

Judicious treatment of competition in telecommunications is far more likely to occur if we clearly define and then grant the same limited freedom to all than if we grant freedom piecemeal and impose limitations on a case-by-case basis.

In the latter situation, too much slips through the cracks. □

Users profit in role as vendors

continued from page 9

orders could be stalled for up to six weeks.

After unsuccessfully scouring the market for software to solve the problem, the company decided to develop its own package. In 1974, a team of programmers was assembled to develop a package called Corporate Data Transfer.

In the first year, the ordering process was cut from six weeks to one day, and the network carried one billion bytes of information among Eastman Kodak offices. The software has grown in popularity. Today, 225 offices use it to transfer 140 million files representing more than 50 billion bytes of information.

In November 1984, Eastman Kodak decided other companies might be interested in the software. The company formed an independent business unit, Eastman Communications (EASTCOMM) and renamed the software to Synchrona.

The business unit, which now employs 50 workers, was placed under Eastman Technology, Inc., a special division set up in 1980 to foster start-up operations. "The company recognizes that start-up ventures require a special type of operating environment," noted Warren Kleiman, vice-president of product development at EASTCOMM.

Eastman Technology is nurturing a number of new businesses, including ventures into the optical disk and image device markets. The most successful enterprise was Kodak batteries, which recently became an independent unit and transferred to another division.

Kleiman said Synchrona software has been sold to customers such as Northstar Bancorp and Fox Photo, Inc. It has been installed on approximately 100 non-Kodak nodes to date. In 1986, the company also added local-area network and personal computer file-transfer software to its repertoire. Currently, there are no plans to transform the unit into an independent business.

Historically, American Airlines has been one of the world's most aggressive telecommunications users. The company gained its reputation by leveraging its on-line reservation system to increase airline business. Last year, the company formed a new division, AMR Information Services, Inc., to act as an incubator for other new ventures. The division is nursing half a dozen start-up ventures, including one that involves home banking.

Another venture, AMR Technical Training, sells telecommunications training to large users. James Pruitt, director of telecommunications training, said, "The company

developed a number of courses to train our own employees and reservation clerks. So, it was a natural evolution for us to sell those services to other users."

AMR Training provides courses in five locations: Boston, Washington, D.C., New York, Dallas and Los Angeles. Five classes are taught: Two are introductions to data and voice communications; two deal with T-1 multiplexing, and one involves network design. The business unit plans to add classes explaining automatic call distribution and Integrated Services Digital Networks.

The training program has a very small staff. Course instructors come from within American Airlines and from consulting agencies. Pruitt claims AMR has an advantage over competitors in the crowded training field. "We are the only end user doing training, and we are dealing with the same issues as our clients," he said.

User credibility was a major concern of Arthur Quirk when he became chief operating officer at Travtech, a Hartford, Conn.-based company formed to sell products developed by The Travelers. "We've found that users are more open to us than they are to a typical software company," he said. "They understand that our products were developed in the real world."

The company's first product was NetPic, a software package that graphically represents a Systems Network Architecture network. Chevron Corp., General Motors Corp. and Electronic Data Systems Corp. use the product.

Since its inception in 1985, Travtech has added a series of system software packages, such as an interface to IBM's DB2 data base management system, to its product line. Most of the OEMs for these products are established software vendors.

Unlike the other two ventures, Travtech remained part of the company's data processing department, and Quirk reports to the vice-president of operations. Travtech has a Spartan staff of seven salesmen. "We were a bootstrap operation and did not take any start-up money from the parent corporation," he said. According to Quirk, the company made money in 1986 and will double its sales in 1987. By 1990, Travtech should be a \$5 million company with a profit of \$1 million.

The start-up has inherent growth limitations. Travtech's market is limited by the fact that the company does not want to offer products that compete with IBM. "We have to anticipate IBM's direction and walk a fine line between head-to-head competition and niche filling," he said.

Also, the company does not want to offer insurance packages that could be used by competitors. "We would give away our business edge if we were offering our software to them," he said.

In addition to being a revenue source, Travtech offers the company other benefits. According to Quirk, "The venture helps to change the perception of the company from a stodgy old-line insurance company to a dynamic information service provider." □

25th TCA ANNUAL CONFERENCE



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AT&T assails FTS 2000 plans

continued from page 9

The Justice Department said the BOCs are not in violation of the Modified Final Judgment, as AT&T has charged. "The decree does not expressly prohibit or permit Electronic Tandem Network switching for private networks," the Justice Department filing stated.

Justice conceded that AT&T's motion "raises difficult issues concerning the line between permissible exchange access service and prohibited interexchange telecommunications service."

According to Justice's interpretation of the Modified Final Judgment, "a BOC is providing [permissible] exchange access service and not [prohibited] interexchange service when providing ETN services."

AT&T said in its emergency motion that the Modified Final Judgment prohibits the BOCs from switching long-distance calls to LATAs that are outside the BOCs' jurisdiction. AT&T also claimed the BOCs cannot provide Martin Marietta or any other carrier with interexchange switching for private networks, even if the calls originate in the BOCs' LATAs.

Martin Marietta said it is not a carrier and, therefore, the Modified Final Judgment does not apply in this instance. The Justice De-

partment agreed with Martin Marietta's position on that point.

"The DOJ's interpretation goes far beyond anything intended by the MFJ," AT&T Washington spokesman Herb Linnen said. "This critical issue of what activities the BOCs can engage in is now before Judge Greene, and we await his decision."

Within bounds of the law

The BOCs and Martin Marietta endorsed the recent Justice Department opinion. "The DOJ's position substantiates our belief that the BOCs' participation in our team is totally within the bounds of the law. Although Judge Greene has the final say, we're fairly optimistic," Martin Marietta spokesman David Wonderling said.

Bell Atlantic Corp. concurred. Justice's interpretation "confirms our own belief that the services in question are not prohibited by the MFJ," company spokesman Larry Plumb said.

Bell Atlantic and a number of other BOCs said they have been providing private network customers with this type of switching for some time. Bell Atlantic said it now provides the federal government with interexchange switching under AT&T's existing FTS contract. AT&T denied that the services in question before Judge Greene and those referred to by Bell Atlantic are analogous. □

TELECOM TRENDS

The four laws of networking

1. Networks never get smaller.
2. Networks never get slower.
3. Networks never stay the same.
4. Networks never work all the time.

An anonymous vendor

► VOICE MESSAGING

Kodak banks on voice-mail net

K-Net has 21,000 users nationwide.

BY BOB WALLACE

Senior Editor

ROCHESTER, N.Y. — Eastman Kodak Co. has constructed a nationwide voice-messaging system designed to speed and simplify communications between the camera maker's corporate headquarters here and regional marketing and product distribution locations.

The seven-node network, dubbed K-Net, is used daily by some 21,000 Kodak employees and

consists of a total of nine voice-mail systems from VMX, Inc. in Dallas. K-Net handles 4,000 hours of message traffic each month. Messages travel between locations over Kodak's AT&T Enhanced Private-Switched Communications Service (EPSCS) network.

The VMX systems used in K-Net are equipped to offer as few as 24 ports and as many as 64. The voice-messaging network includes several VMX Model 3s, which sup-

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Eastman Kodak Co.'s national voice-messaging network (K-Net)



Voice-messaging network nodes are interconnected using AT&T's Enhanced Private-Switched Communications Service. Eastman Kodak plans to add New York to the network in the first quarter of 1988. Sites in Colorado and in Canada will be added at a later date.

SOURCE: EASTMAN KODAK CO., ROCHESTER, N.Y.

CROSS TALK

BOB WALLACE

Versatile consultant aids hoteliers

In her effort to lay the groundwork for a project designed to reduce communications costs for 1,800 independently owned Best Western International hotels, Teddy Starkey serves as a teacher, an inventory manager, a user-vendor liaison and a corporate publications manager in addition to her daily duties as a telecommunications consultant.

In late April, Best Western signed a pact with Allnet Communication Services, Inc., a subsidiary of ALC Communications, to provide direct-dial long-distance services to Best Western hotels. And, less than two months later, the hotel chain entered a two-year contract with Tel Electronics, Inc., under which the vendor will install 700 call-accounting systems at Best Western hotels beginning this month.

Before she could begin pitching the Allnet calling services and the Tel Electronics call-accounting systems, Starkey found she had to explain to hotel operators how the use of these resources would save them money and improve the process of billing hotel guests for telephone calls.

Starkey claimed use of the Allnet direct-dial services could reduce each site's monthly telephone bill by as much as 20% by sharply reducing hotel reliance on AT&T Hotel Billing In-

formation Center (HOBIC) lines. Wide usage of the direct-dial services would slowly eliminate the need to place operator-assisted calls over HOBIC lines. Use of the call-accounting systems would enable Best Western hotel owners to track their own calling usage.

Trying to collect information concerning the hotels' telephone systems and add-on equipment also proved to be an uphill bat-

Educating hoteliers on telecommunications was the toughest aspect of the project. "Some hotel owners didn't even know what a PBX was," she said.

tle. "It has been very difficult to secure accurate information on what PBX each site has. I've tried attending the company's annual corporate convention and have done equipment surveys over the telephone," Starkey explained.

Policy now requires all Best Western hotels to notify the telecommunications department when they change or upgrade voice communications equipment.

To help familiarize Best Western hotel owners with telecommunications, Starkey logged several hours in a special booth at the corporation's annual con-

vention last October and arranged with several of Best Western's current telecommunications vendors to acquire lists of the hotels' current telephone systems. To streamline data collection from hoteliers, Starkey created a telecommunications survey that all new Best Western hotel operators must complete and return.

Trying to educate hoteliers on telecommunications was the toughest aspect of the project.

"Some of the hotel owners didn't even know what a PBX was," Starkey said.

Several of Best Western's equipment and service vendors, including AT&T and Tel Electronics, provided information they had regarding what PBXs and add-ons they had provided to Best Western hotels. "This will help me keep the hotels' equipment inventories straight," she added.

Starkey plans to update representatives from Best Western's seven regions on telecommunications projects under way when these delegates meet in Phoenix later this year.

She also uses the hotel chain's worldwide reservation center to send brief messages to individual hotels regarding upcoming meetings and projects under way or to ask hotel managers to supply equipment and calling-service information for

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► LONG-HAUL NETS

Lightnet, WilTel ink swap deal

BY BOB WALLACE

Senior Editor

ROCKVILLE, Md. — Regional fiber-optic long-haul carrier Lightnet, Inc. recently announced a traffic-swapping deal with Williams Telecommunications Co. (WilTel) and said it will begin offering coast-to-coast services next month.

The Lightnet network already offers service to users in 38 cities east of the Mississippi River, and it is scheduled to reach 5,000 miles when a New York-to-Boston link is completed next month. WilTel's network supports 40 cities west of the Mississippi River.

Under the arrangement, the carriers will interconnect facilities in both Chicago and New Orleans to give current and prospective users access to much of the resulting 10,000-mile, nationwide network.

Lightnet offers digital private-line services at speeds up to 1.54M bit/sec and 3.15M bit/sec, and a T-3 (45M bit/sec) service. The carrier said these services, as well as video teleconferencing, will be offered over the net next month.

Founded in 1983, Lightnet is owned by subsidiaries of Southern New England Telephone and CSX Corp. WilTel is a subsidiary of Williams Telecommunications Group, Inc. (WTG). WTG was formed last month after WilTel acquired LDX Net, Inc., a provider of private-line services. □

► **SYSTEM MANAGEMENT TOOLS**

Vista-United, TCT sign sales pact

ORLANDO, Fla. — Hoping to capitalize on strong user demand for PBX and add-on system management tools, Vista-United Telecommunications recently signed a nationwide marketing pact with TC Telemanagement, Inc. (TCT) to sell its personal computer-based switch management software packages.

Terms of deal

Vista-United will sell TCT's Automatic Call Distributor (ACD) and Traffic Management systems, which currently run on Northern Telecom, Inc.'s Meridian SL-1 family of digital private branch exchanges.

Vista-United, a partnership between the Walt Disney Co. and United Telephone, was initially created to meet the telecommunications needs of the Walt Disney World resort complex here.

TCT President Charles Brink said his company's relationship with Vista and large user companies such as The Dun & Bradstreet

Corp., NCNB National Bank of Florida and Walt Disney Central Reservations contributed to the development of the vendor's ACD management package. ▢

Kodak banks on voice mail

continued from page 11

port a maximum of 258 hours of voice messages, and one VMX Model 5000, which can store up to 526 hours of messages.

Despite the huge network size and the sheer number of K-Net end users, Kodak Telecommunications Services Manager John

Schooley said there have been no port contention problems or instances in which the VMX systems' processing horsepower has been insufficient.

Kodak has, however, encountered some message-storage problems because K-Net users are often lackadaisical about erasing messages. "We currently support a two-week retention period for the mes-

sages," he said. "We don't see the system as an archival-type service, but people do tend to hang on to messages for a long time." Schooley said creation of a uniform specification for the length of the message and how long messages can be retained would free up more disk storage space.

Schooley said he finds two of the VMX system's features particularly use-

Versatile consultant

continued from page 11

inventory purposes.

The telecommunications consultant also takes the opportunity to add questionnaires, memos and other messages to the hotel's bimonthly supply shipments. When the heads of each Best Western hotel meet this fall for a one-week orientation at the lodging chain's headquarters, Starkey will be emphasizing the need for better communications between these individuals and the company's telecommunications department.

Selling begins

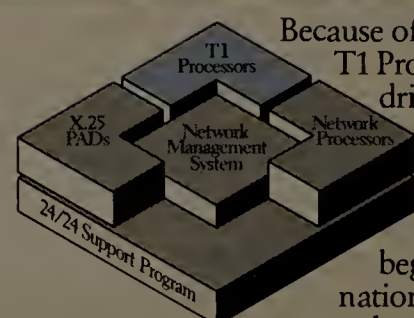
Having finally received the information on each hotel's telephone system and add-on equipment, Starkey will start selling the services and equipment to Best Western hotels on a regional basis, beginning with locations in the metropolitan Cincinnati area.

Starkey attempts to get the word out on new telecommunications projects by writing pieces for "Trade Notes," the hotel chain's newsletter, which is mailed to the owners of all Best Western hotels. ▢



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ful. "If I want to send the same message to six staff members, I can use the system's broadcast capability and simply enter six K-Net addresses," Schooley explained. Identical messages are immediately sent to the voice mailboxes of the six other users, regardless of their location on the network.

The telecommunications manager also makes exten-

sive use of VMX's two-digit broadcast code feature, which enables him to send messages to groups of users without entering each individual's network code.

Schooley could, for example, create a group code for his telecommunications staff of nine and send identical voice messages to each address with a single keystroke. "This capability gives us a great deal of

flexibility. I have 10 addressing slots to work with. Two or three of those could be group codes, and the others could be individual end-user addresses," he explained. End-user addresses, regardless of where the user is located, can be listed in group codes.

"We get to meet only once a week at best," Schooley explained. "I can share information with

these people much faster using K-Net. When you take the approach of telephoning each one of these people or catching them in the hallways, there is always the risk that you forget an item or you give more information to some than others."

Schooley said less advanced voice-messaging systems required each node to house a complete routing

table that included all K-Net end-user addresses. VMX requires maintenance of one routing table.

Increased use of the elaborate voice-messaging network is expected to eliminate use of intercorporate memos. Roger Benson, a telecommunications staffer for Kodak, said K-Net has significantly changed the work load within some departments. "Our product distribution division's word-processing center noticed that its work load was declining but didn't know why," Benson said. "After analyzing the situation, they determined that the one-page paper memo was disappearing. End users were using K-Net instead of having a document typed up and distributed."

Because of K-Net's size, Schooley said, Kodak decided not to rely totally on VMX's service technicians for all network problems. "We've made our front-line people adept at working with VMX technicians over the telephone," Schooley said. "When we have a serious problem, we need a second-level technician, a guru that no user company could afford to have stationed in any one city. In these situations, we work with high-level technicians from VMX or a service company over the telephone."

Kodak provides all 21,000 K-Net users with an 800 number they can call for assistance in using the network or to report problems. Staffers man this telephone 24 hours a day. Schooley said one computer operator is assigned on an as-needed basis to maintain each K-Net node.

The telecommunications services manager said the system is simple and easy to use. A series of prompts guides the user through the voice-messaging system. The VMX system also enables an end user to exit the system at any point of its operation. "If end users can get over their normal human tendency to be a little afraid of computers, they could call into the system and teach themselves how to use it," Schooley said.

Schooley said the 3-year-old voice-messaging network is marked for major expansion. He predicted that the total number of end users on K-Net would soar to 24,000 by year's end. A trial project to tie Kodak employees in Japan to the network is scheduled for early next year. Eventually, Kodak also plans to link its locations in Australia to K-Net. □



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DATA DELIVERY/ NET MANAGEMENT

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On his company’s plan to develop a network that supports 500M bit/sec transmission.

► NETWORK STRATEGIES

T-1 ticket to cost control

Backbone net steadies ticket agency’s communications tab.

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — A T-1 backbone network is helping a ticket agency here stabilize its communications costs and provide better service to its customers.

Ticketmaster, Inc. sells tickets to events sponsored by a variety of clients in New England and New

York, including the New York Yankees, the Nassau Colosseum, Meadowlands Stadium, Radio City Music Hall and Tanglewood. At its central facility here, an automatic call distributor (ACD) routes calls to operators who process ticket requests.

In April, the company installed two T-1 lines. One runs from the central site to a remote office in

Cambridge, Mass., and the second goes to an office in East Rutherford, N.J. The T-1 lines replaced WATS lines.

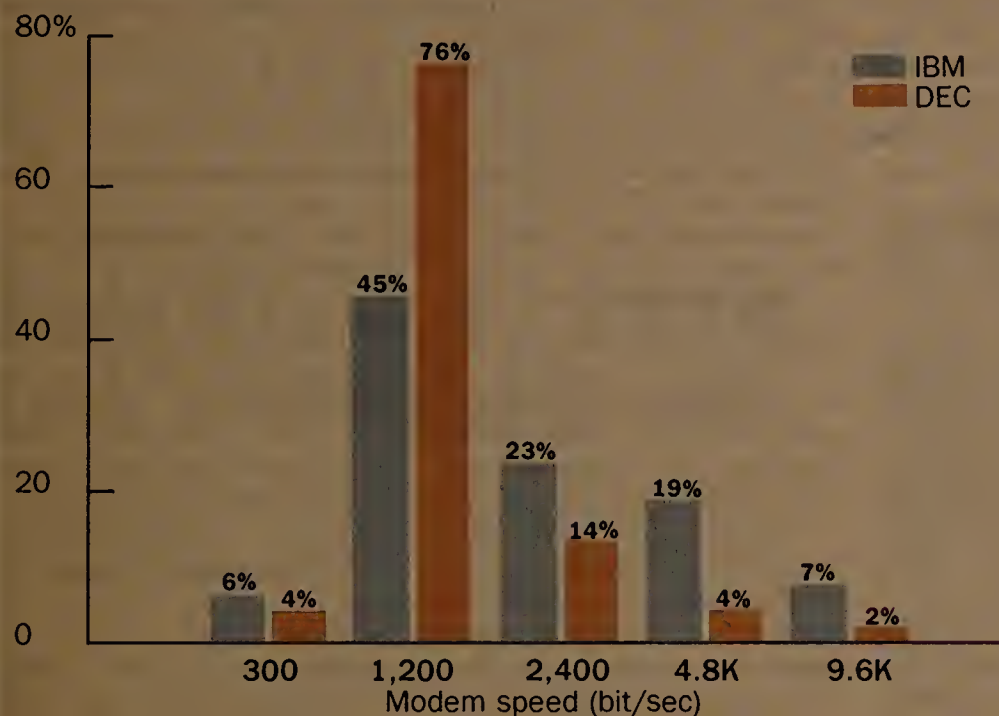
“Our main concern was the varying cost of our WATS lines,” said Gene Cobuzzi, comptroller at Ticketmaster. He said the time needed to complete a ticket sale varied from two to 10 minutes. During peak periods, customers

could be put on hold for five minutes or longer. As a result, Ticketmaster’s monthly communications bills varied by as much as 35% each month.

Nine months ago, the company began examining installation of a T-1 network that would stabilize communications costs. Because costs of T-1 links are fixed, the company hoped to reduce wide fluctuations in monthly charges. Ticketmaster hired a pair of consulting firms to aid in configuring the network and selecting equipment. The consultants recommended that calls from remote offices be channeled into T-1 multiplexers

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Modem usage at IBM and Digital Equipment Corp. sites



SOURCE: COMPUTER INTELLIGENCE CO., LA JOLLA, CALIF.

IBM INSIGHTS

Plans and possibilities for the 3737. On June 16, IBM announced its first channel extension unit, the IBM 3737, and a joint marketing agreement with Network Equipment Technologies, Inc. (NET).

The 3737 provides a point-to-point connection between two IBM hosts over a T-1 line. NET manufactures a line of T-1 multiplexers known as Integrated Digital Network Exchanges (IDNX). As part of the marketing agreement, NET gave IBM license to employ communications protocols used with the IDNX. Analysts speculated that NET aided in the development of the 3737 and that future IBM channel extenders might be more closely integrated with the IDNX. A few predicted IBM would develop a single offering combining the

functions of both products.

According to IBM, those predictions are off the mark. IBM said the 3737 was developed by IBM employees at the company’s Communication Products Division in Raleigh, N.C. Larry Ladd, IBM’s senior product administrator for telecommunications product marketing at the Information Systems Group, denied that integrating the channel extender and the IDNX was part of IBM’s plans. He said the company designed the 3737 for ease of use. He said that key selling feature would have been lost if the product was integrated with the more sophisticated IDNX.

Ladd discussed enhancements IBM would like to make to the 3737, including enabling the device

See page 16

DATA DIALOGUE

DAVID EDELHEIT AND MIKE LATRIANO

Net control services: weighing the options

Voice and data networks have become more difficult to manage, and a number of third parties, hoping to capitalize on the situation, have offered network management services.

Three types of vendors — carriers, equipment providers and service bureaus — offer such services, handling part or all of the net management tasks for a user. Each has its own reasons for getting into the service game. Thus, there are significant differences in the vendors’ strategies and in the services they offer. Which service is most useful depends on the user’s needs.

Carriers offer network management services to make their principal product, transmission services, more attractive.

A classic example is AT&T’s approach to selling private lines. Three options are available: Transport Service, Total Service and Coordinated Access.

With Transport Service, the user obtains only interexchange transport circuits from AT&T. In order to obtain a complete circuit, the user must also obtain local channels directly from appropriate local carriers. In this environment, the user is completely responsible for engineering, installation coordina-

tion and end-to-end maintenance of the circuit. Should the circuit degrade or fail, the user must determine which component is at fault and contact the appropriate carrier.

Because that’s too much work for most users, AT&T offers Total Service. A Total Service user obtains a complete end-to-end circuit from AT&T. AT&T obtains and resells, at a premium, the local channels. More important, AT&T assumes complete responsibility for circuit installation and management. If the circuit degrades or fails, the user has only to call a single vendor. AT&T charges for these services through a tariffed Access Coordination Function (ACF) charge.

The third option, Coordinated Access, is a hybrid of the other two approaches. The user signs a letter of agency, which permits AT&T to act on the user’s behalf in dealing with the Local Exchange Carriers (LEC). The user can obtain local channels from the LECs at their tariffed rates, without any markup by AT&T. AT&T handles engineering, installation and maintenance, for which the user pays a monthly ACF charge. As with Total Service, users have a single point of contact when a problem occurs. Many users feel Coordinated Access combines the best features of Transport Service and Total Service.

Other carriers offer network

See page 16

Edelheit is senior manager and Latriano is a consultant at Price Waterhouse & Co. in New York.

T-1 ticket to cost control

continued from page 15

linked to channel banks at the central site. From the channel banks, calls would be fed to the company's ACD.

Ticketmaster wanted to implement T-1 capabilities slowly and needed a flexible multiplexer that would grow as the company became more comfortable with its network.

Cobuzzi and the consultant teams examined six companies' T-1 multiplexing equipment, including products from AT&T and ITT Corp. When the evaluation was complete, Ticketmaster opted for an Accudacs 400 from Integrated Telecom Corp. (ITC), a start-up company in Dallas. "The other vendors were trying to sell us equipment that was still in the design or testing phase," Cobuzzi said. "ITC already had customers using its equipment."

The cost of the equipment was the least important factor in the decision-making process, according to Cobuzzi.

Ticketmaster ordered the device at the beginning of the year but had to wait four months for its T-1 lines to be delivered. Ticketmaster had to coordinate its T-1 installation with six companies, including New England Telephone & Telegraph Co., Southern New England Telephone, New York Telephone Co., AT&T and New Jersey Bell.

The most difficult part of the installation was set-

ting up a backup network in case the T-1 lines go down. "The telephone companies did not really understand what we needed," Cobuzzi said.

Initially, Ticketmaster decided to use only half of the bandwidth available on its network. The Accudacs includes a version of the Adaptive Differential Pulse Code Modulation (ADPCM) feature, which increases the number of voice channels on a T-1 line from 24 to 44. This version of ADPCM conforms to the latest set of telephone company specifications and differs from other ADPCM implementations that provide 48 channels. Ticketmaster decided to use only 44 of 88 channels on its two T-1 lines. "Our traffic requirements vary greatly," Cobuzzi noted.

"When tickets for a major event go on sale in Boston, we may want 30 channels going to Boston and 14 to New Jersey. We needed a multiplexer that would allow us to change our configuration two or three times a day."

Since the installation, Cobuzzi has been a satisfied Accudacs customer.

"We haven't had a failure with any piece of primary equipment on the Accudacs," Cobuzzi said.

Ticketmaster has upgraded its network so it uses all of the 88 channels on the two T-1 lines. "The network has enabled us to provide better service to our clients," Cobuzzi said. The 88 channels are almost twice as many as the WATS network provided. □

Net control services

continued from page 15

management services through their transmission facilities. For example, Cable & Wireless Management Services, Inc. (C&W) offers services known as Tele-Site and Tele-Site Plus. Tele-Site is currently available at 25 C&W points of presence (POP). The basic service allows a user to rent floor space or rack space at the POP for the installation of multiplexing, switching or network control equipment.

C&W provides routine test assistance during standard business hours. Under Tele-Site Plus, currently available at 13 of C&W's POPs, complete 24-hour-a-day, seven-day-a-week maintenance and network management services are available.

The principal limitation of carrier-supplied network management solutions is that they are primarily oriented to managing the facilities offered by the carrier. For example, one cannot pay AT&T an Access Coordination Charge for the installation and maintenance of a circuit that does not make use of its facilities. Similarly, C&W's Tele-Site service resides solely at C&W POPs. That's a problem for large users that have multivendor environments.

In contrast, net management services offered by equipment vendors are targeted at users with the finances to purchase a sophisticated network control facility, but without the manpower to staff it.

For example, Codex Corp. offers a service based on its 4850 Network Management System. The company places diagnostic equipment at the customer's remote sites and interrogates them from a Network Control Center in Schaumburg, Ill. The diagnostic equipment typically consists of either Codex diagnostic modems or wrap-around devices, which

have access to both the analog and digital sides of other modems.

The Codex NCC runs the 4850 Network Management System on a Data General Corp. MV4000 loaded with a copy of the user's network data base. A private line between the Codex NCC and the user's central site is used for network control purposes as well as for transmission of management reports to a printer on the customer's premises. The Codex service started in the fall of 1986 and currently manages approximately 200 to 300 circuits in 11 states on a 24-hour-a-day basis.

One difficulty with this approach is that it locks users into the vendor's product line.

The services operate most efficiently with the vendor's equipment, and the use of wraparound devices often carries with it a loss of functionality.

These vendors often have a myopic view of a user's network management needs. Modem-based vendor services are excellent for data transmission over analog private-line networks but offer little help in managing digital circuits or voice networks.

Service bureau net control offerings are not tied to specific vendors of transmission facilities or equipment, so they avoid many of the limitations discussed above.

PacTel Spectrum Services is one such service bureau. The company is owned by Pacific Telesis, but its services support any carrier, any protocol, any type of circuit, with any type of termination equipment. PacTel's approach utilizes a custom-designed device known as a Remote Test Computer (RTC), which is installed in the user's central site. The RTC is designed to work in conjunction with several pieces of customized net-

work management equipment deployed in the network.

PacTel initially performs a detailed inventory of the user's network, and constructs a data base, which resides on a Digital Equipment Corp. VAX 8600 host computer in one of three response centers in Irvine, Calif., Walnut Creek, Calif., and Rutherford, N.J. A sophisticated application program running on the VAX interrogates the network control equipment via the RTC.

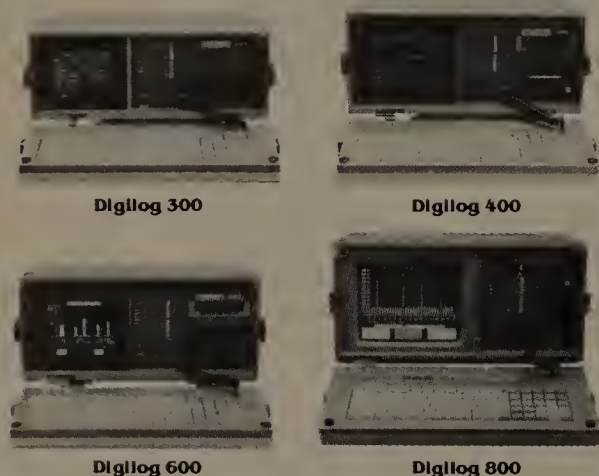
Modems are enveloped by a proprietary wrap-around device, and voice circuits are interrogated using off-the-shelf products. The program proactively monitors the network and often alerts technicians to circuit degradation before a failure actually occurs. The program has an elaborate data base with provisions for multiple vendor contacts. Also, the data base can be customized.

The program opens a log when an incident arises and tracks the problem to resolution. In addition to providing extensive management reports on response times, repair times and open trouble tickets, the system periodically reminds operators of unaddressed problems. The operator interface is user-friendly, making use of color graphics on a large, high-resolution CRT.

PacTel Spectrum Services was launched in September 1985. It currently supports approximately 1,300 client locations in 38 states.

Other service bureau providers include EDS Communications Co., and Crowntek Communications, Inc. EDS' network currently supports 16 data centers, 5,000 users and more than 250,000 terminals.

Because EDS has no proprietary network management hardware or software, it can support various types of management services. □



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Insights from page 15

to support faster transmission and attach directly to peripherals.

Supply lagging behind demand. Customer acceptance of NetView, IBM's host-based network management system, seems to be creating a problem. IBM sponsors a series of seminars in which representatives explain some of the product's features to customers, and demand for the classes is currently outstripping supply.

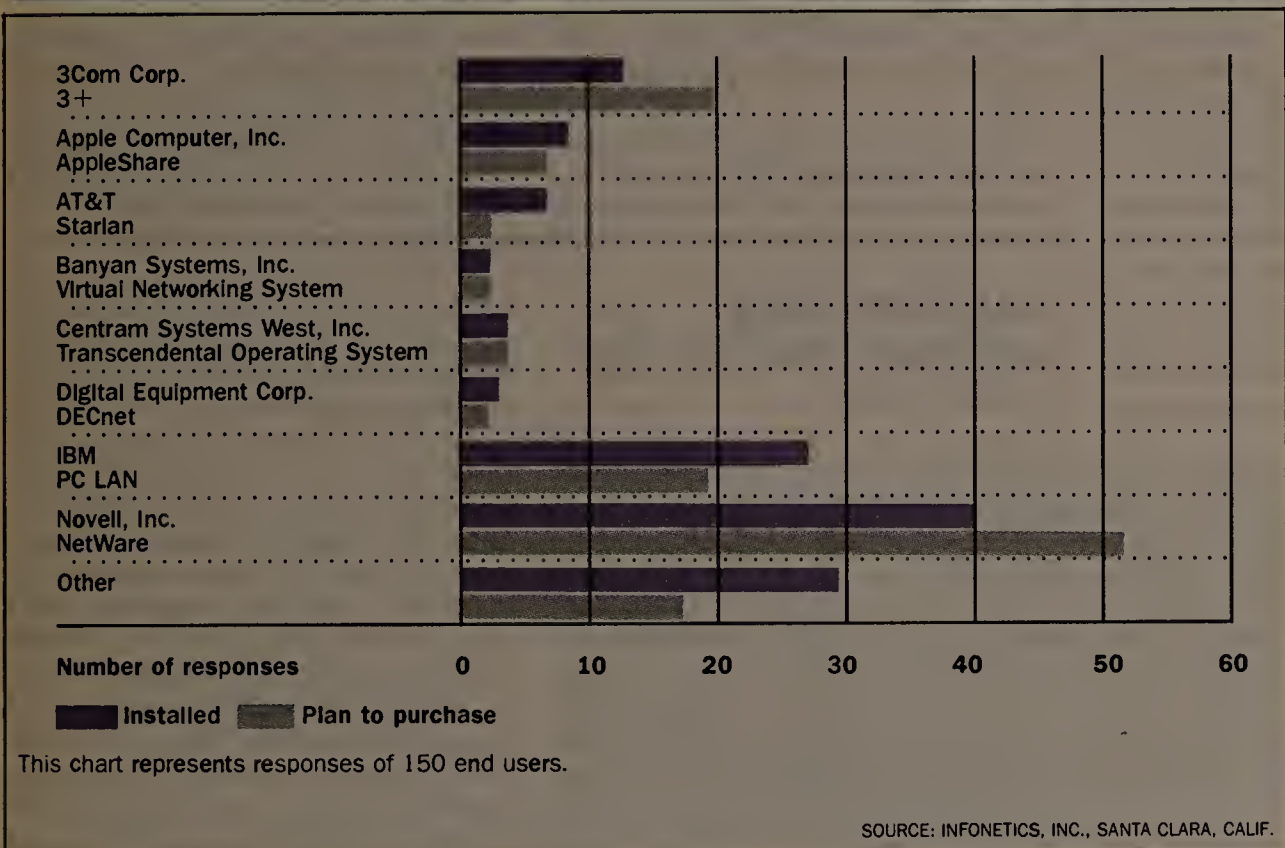
One New York communications manager told *Network World* he was No. 75 on a waiting list for a class limited to 20 people. He was told the class is restricted because there is a limited number of IBM trainers and terminals, used for hands-on demonstrations, assigned to each class. Despite a healthy backlog of potential attendees, the next class in New York is not scheduled until the fall.

The manager showed up

for the class and was able to attend in place of another student who failed to show up. But he said he was disappointed because the class focused on the first release of NetView, which began shipping last winter. He was more interested in learning about the second release, which supports NetView/PC, a gateway from NetView to other vendors' network management systems. IBM has yet to schedule seminars dealing with this release. □

LOCAL NETWORKING

Users reveal preferences for network operating systems: installed vs. plan to install



VINES used in Spanish election

Results of Spain's recent national elections were tallied and reported with the help of Banyan Systems, Inc. servers and the company's Virtual Networking Software (VINES). Twenty-five VINES-based servers, linked to mainframes, were used to tabulate the results, which were displayed on personal computer screens in public locations around the country as well as at the Spanish congress for the nation's press corps.

BUSINESS COMMUNICATIONS

Apple's mixed reviews arrive

Users say firm has yet to bring Mac into the business market.

BY MARY LINEHAN
Staff Writer

BOSTON — Despite Apple Computer, Inc.'s well-publicized assault on the business market, users at the recent Macworld Exposition here said the company still has a long way to go in integrating its Macintosh into IBM Personal Computer-dominated corporate nets.

"Apple is trying to bring the Mac into the business world, but it is the third-party manufacturers that are really doing that," said Steve Costa, a consultant and member of the Berkeley Macintosh Users Group. "When you talk about networking with Macintosh users, you're not talking about Apple products, but about third-party products."

Robin Stern, a relocation consultant for Advisers Ltd. See page 18

COMMUNICATIONS SOLUTIONS

LAN LU 6.2, 3270, DIA software out

Products share core gateway.

BY MARY PETROSKY
West Coast Correspondent

SAN JOSE, Calif. — Having helped such users as Baxter Healthcare, Inc. develop custom local network versions of its Access/SNA products over the past year, Communications Solutions, Inc. (CSI) is making generally available networked implementations of its IBM LU 6.2, 3270 and Document Interchange Architecture (DIA) communications software.

CSI's Access/SNA APPC, Access/SNA 3270 and Access/DIA software will be available in networked versions in September. Although they are three distinct products, the networked versions of the Access/SNA products share the same core software on the communications gateway, according to Steve Martinez, vice-president of marketing and sales. Users on the network run the appropriate presentation services software on their workstations in order to

get the specific 3270, LU 6.2 or DIA capabilities they need.

There are several benefits of splitting the code between the gateway and workstations, Martinez said. Since the same core code for all three products runs on the same gateway, the gateway can use a single data link to the mainframe.

This feature also allows users to access multiple SNA sessions, regardless of whether they are 3270, LU 6.2 or DIA applications. As a result, users can more easily migrate to new distributed applications using LU 6.2 while maintaining existing 3270 applications, Martinez said.

Splitting the software between the gateway and workstation also means fewer code runs on the workstation, cutting down on the required memory. The core code running on the gateway requires between 250K and 300K bytes, while the 3270 pre-

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LANMARKS

ERIC H. KILLORIN

Engineering market heats up

During the past few years, most of the activity in the local networking market has centered around connecting terminals, servers, host computers and personal computers. Now, the market for high-performance engineering workstations networks is heating up.

Networks that connect these computers are nothing new. Digital Equipment Corp.'s stronghold has always been the engineering community, and its users have relied primarily on Ethernet — or similarly configured high-throughput local-area nets — for linking VAXes and VAX workstations.

Customers of Hewlett-Packard Co., Prime Computer, Inc. and other minicomputer vendors usually have relied on some local network transport mechanism supplied by the vendor in order to shuffle complex documents and graphic images between engineers' desktops.

Today, however, developments from firms such as Sun Microsystems, Inc. and Apollo Computer, Inc. are redefining what users expect from local-area networks. While these firms' products emphasize the networking of engineer-

ing applications, the vendors are leveraging the performance of their workstations and high-speed networks to establish a beachhead that will let them advance into the commercial world.

Growth in the local network market for engineering workstations is being fueled by the evolution of the personal computer and the aging of the minicomputer. The personal computer, with the 80386-based architecture rapidly becoming the de facto processor platform, is gaining many of the functions of a full-blown minicomputer.

The high-end models of IBM's Personal System/2 family, for example, have performance attributes similar to traditional minicomputers but are priced in the \$10,000 to \$15,000 range. Soon, products like the IBM Series/1 and even the dedicated VAX will be displaced by desktop computers with equivalent performance.

This convergence has opened the market for multiuser, hot-rod boxes that allow customers with diverse application requirements not limited to engineering applications to combine the functions of terminals, personal computers, minicomputers and hosts all in one slick workstation.

But with more local storage available to workstation users and with the performance increases offered by 32-bit addressing, users will expect far

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Killorin is the publisher of "Netline," an industry newsletter on computer networks. He is also president of Hyatt Research Corp., a data communications market research firm based in Andover, Mass.

Apple's mixed reviews arrive

continued from page 17

in Roselle, Ill., and member of The Rest of Us, a Chicago Macintosh users group, agreed with Costa. "Right now, there are more products available through third-party manufacturers," Stern said, "but it remains to be seen who really brings the Mac into the business market. Some of Apple's marketing decisions have held them back, but that's all changing now."

Other users complimented Apple's communications products. Stephen Rea, a microcomputer consultant and member of the New York AppleCider users group, said that Apple's connectivity products are improving. "I think Apple is supplying the products to help the Mac into the business sector; we're seeing that move already," he said.

"Third-party multivendor communications offerings for Macintoshes do not go much beyond file sharing and terminal emulation," Rea said. "But Macs' open interfaces make connections and communications much easier."

Other users cited the Apple networking and communications products for their ease of implementation. "We are putting in an AT&T Starlan right now, and the whole thing — IBM PCs and all — has been sitting there for a week waiting to be hooked up. Our Ap-

ple local net — four Macs and one IBM [Personal System/2] — was up in 30 minutes," said Harold Sasser, senior systems engineer for Virginia's Department of Information Technology.

"The Apple local-area net we have is small [10 workstations], but their communications products are good enough. We do research and development for state purchases and, right now, are very happy with Apple products," Sasser said.

Mark Lyons, a consulting engineer for Xerox Corp., concurred. "For the office environment, Apple is producing good connectivity products to back up the Mac. AppleTalk is very good; we were able to hook up a whole floor in less than three hours," Lyons said.

Lyons said his department's AppleTalk net serves about 13 people.

Chevalier Tucker, the owner of Chevalier!, a small advertising and graphic design company in Allentown, Pa., said Apple products far outdistance IBM products in graphics.

"Apple is faster, better and cheaper than conventional methods," said Tucker, whose company employs 16 people. "They are far ahead of IBM in the kind of graphics applications we use. I'm not sure if [Apple] will be able to carry Mac into the business world with its connectivity products, but the products are more than sufficient to meet my concerns." □

LU 6.2, 3270, DIA software out

continued from page 17

sentation services require approximately 40K bytes of workstation memory, LU 6.2 services 20K bytes and DIA services 70K bytes.

CSI designed the networking software to be compatible with IBM's Network Basic I/O System and has tested the software on the IBM Token-Ring Network, IBM PC Network and 3Com Corp.'s 3+, Martinez said. Since users receive source code for the products, however, they are able to customize it for any network, he added. The software is available on a license basis.

Baxter Healthcare has been using CSI's Access/SNA products on gateways since last June, accord-

ing to Mike Baker, director of distributed systems for the Information Resources Business Technical Division of Baxter Healthcare, in McGaw Park, Ill. ("Planning for LU 6.2 is difficult, users lament," NW, Feb. 23).

The health care company did some customization of the original CSI products, including setting up networked personal computers as LU 6.2 gateways.

Unlike CSI's networkable products, which use IBM's Advanced Program-to-Program Communications across the net, Baxter Healthcare is using NETBIOS to communicate between network nodes and the gateway, Baker said. □

Engineering market heats up

continued from page 17

more of local networks than the 10M bit/sec transmission rates that seem excessive today.

The subsecond response time offered by workstations will condition users to expect the same behavior from their networks.

This is good news for the user community since the network will become merely an extension of the workstation's internal bus. It also offers a challenge for local net ven-

dors that must make networks as transparent as possible and market network adapter cards loaded with adjunct processors.

It's bad news, however, for those who like to carve up the processor marketplace into comfortable size classes since the distinction between microcomputers, terminals and minicomputers will blur, potentially into one multi-function device. We're entering the era of the versatile computer, and the progress made with local nets will either make or break the concept. □



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COMMUNICATIONS MANAGER

What's No. 1 in the UK

Information systems professionals in the UK's 100 largest companies said their most important concerns are business-related, not technological. In a survey conducted by the London Business School for the Index Group of Cambridge, Mass., senior information systems managers said the most important issue they face is ensuring that they meet the overall corporate business goals.

► USERS GROUP PROFILE

Financial league flourishes

For Wall Street group members, communications is money.

BY MARY LINEHAN
Staff Writer

Nearly two decades ago, in response to the special needs of the Wall Street brokerage community — where time really is money — a group of communications managers formed a coalition to learn how to provide better service to their respective firms.

The Wall Street Telecommunications Association (WSTA), which turns 20 next year, comprises about 110 firms and 500 members from the most prestigious financial institutions on Wall Street.

"Speed is vital. We demand a higher quality service because of the trading operation," said Connie Schack, program chairwoman of the WSTA and communications

manager at Pershing and Co.

"Brokerages are communications-intensive," Schack said. "Traders don't want to hear how you saved them \$300,000 on one hand, when they just lost \$1 million because of a blown circuit."

Jim Troy, WSTA activities chairman and communications

manager at Cowen & Co., agreed.

"Communications is critical to this business," Troy said. "The WSTA has tried to bring all member firms of the New York Stock Exchange together, and the fact that we are such a large group carries clout with vendors and helps ensure us high-quality service."

Wall Street Telecommunications Association

- Founded in 1968
- Dedicated to the exchange of information about telecommunications
- More than 100 member companies, including all major Wall Street brokerage houses
- Individual companies must have responsibility for company voice or data communications, trading market data or office automation

Membership is currently restricted to brokerage house communications managers responsible for voice, data, market data and office automation. However, a proposed change in the association's bylaws, scheduled to be voted on this fall, would extend membership to telecommunications managers at banks and insurance companies.

By expanding their membership to include other financial institutions, the organization would be better able to serve Wall Street's financial community, said WSTA President Phyllis Lampell.

"Expanding the membership base will give us a broader range of people interested in telecommunications services pertinent to our industry," Lampell said. "Banks and insurance companies use a lot of the same communications services and products that brokerages do and, therefore, share many of the same experiences," she said.

Lampell, communications manager at Dillon Read & Co., Inc., said

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GUIDELINES RICK MARGOLIS

Who will manage the managers?

When I first went into management consulting, my family and friends were supportive. "Those who can't do, teach," offered one friend. "And those who can't teach, consult," I replied warily, wondering if I'd ever told her I had once taught.

Another particularly supportive friend claimed some knowledge of my newfound profession. "Let me give you the definition of a consultant," he said. "A consultant is a person who uses somebody else's watch to tell them what time it is."

In my father's view, the profession had religious overtones, and my entry into consulting was akin to taking holy orders. "Consulting," Dad said. "That's when you lay hands on the dying, pray, and send a bill at the end of the month to the widow."

It is true that the field of management consulting has, in some quarters, what may be most charitably described as an

"image problem."

Many executives see consultants not as allies but as wily adversaries, more concerned with extending their contracts than with finding efficient solutions to client problems. For their part, consultants often see clients as demanding quick fixes and assorted miracles without making realistic commitments of time and resources.

"Those who can't do, teach," offered one friend. "And those who can't teach, consult," I replied warily, wondering if I'd ever told her I had once taught.

Management consulting, however, is a \$2 billion business that can, and often does, help people and organizations become more efficient and productive.

Generally, management consultants can be described as coming in two varieties: the expert and the facilitator.

The expert is somewhat like a physician who possesses specialized knowledge of a specific area. It may be, for example, financial analysis, quality con-

trol, cost accounting, marketing or information systems design.

The use of an expert is most appropriate when a clearly defined problem or need arises. A true expert combines a knowledge of the state of the art with years of experience in the field.

Unfortunately, problems and their causes are often not clear-cut and obvious. For example, an organization may possess a group of technically proficient, high-achieving managers who can't function as a cohesive executive team. A previously dynamic and innovative manager may become frustrated and start to flounder in a new supervisory role, causing the morale and effectiveness of subordinates to decline. The production division may resent the engineering division for designing parts whose tolerances appear to far exceed what is necessary for the product. The human resources director may feel sabotaged by a corporate vice-president's suggestions about restructuring employee incentive benefits.

These scenarios, based on real situations, underscore the connectedness of people in business settings and their reliance

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DIALOGUE

Do cellular telephones fall under your communications budget? How do they fit into your networking plans?

"Cellular phones fall under our communications budget, but they are not connected to our network. We support portable cellular phones and some that are permanently installed in our cars. They are not a networking-type device; they are just used to make calls."

Bill Ifkovic

Data communications manager
Chesbrough-Pond's, Inc.
Trumbull, Conn.

"We just have a few of them we use on our trucks, and the money for them comes from our communications budget. I know of no plans to include them in our network."

Pat Lehman

Communications coordinator
The Singer Co.
Glendale, Calif.

"We have four or five in the company. We pay for them out of the communications budget, but then the user is charged. The phones are used by executives locally, so at this time, we see no need to make it part of our network."

Jim Carolan

Director of information
systems and development
Gap, Inc.
San Bruno, Calif.
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Margolis is director of program development for MAGE Centers for Management Development, a management consulting firm with offices in Boston, Montreal and Toronto.

ASSOCIATIONS

The Tele-Communications Association (TCA) has decided against joining the Corporation for Open Systems (COS) as an affiliate member, William Moore, director of TCA's government liaison committee told *Network World* last week. According to Moore, many TCA members are from small companies that have no immediate concerns about open systems and other connectivity issues with which COS is involved. He said most TCA members from large corporations are also members of the International Communications Association, which recently joined COS as an affiliate. Other top TCA officials were unavailable for comment.

On another front, Moore said the San Diego-based TCA is monitoring the efforts of municipalities to impose surtaxes on long-distance phone calls ("L.A. law raises ire of users," *NW*, June 29). He said TCA is trying to let the public know the taxes are not rate increases but are the work of public officials.

The Ad Hoc Telecommunications Users Committee, which represents some of the largest users in the country, is concerned about the continuing rise in special-access charges levied by the local operating companies, according to the group's legal counsel, James Blaszk of Washington, D.C. "We continue to be concerned about the non-cost-based increases in local-access service," Blaszk said. "They are not even close to being reasonable."

Blaszk said he believes the Federal Communications Commission should make available to all concerned parties data concerning tariff changes, including supplementary data submitted in response to FCC questions on filings.

According to Blaszk, interested parties such as the Ad Hoc Telecommunications Users Committee are not privy to the carriers' responses to questions submitted to the carriers by the FCC following the public comment period. "I'm not suggesting there is anything procedurally improper about the commission's action," Blaszk said. "But I am saying it would be fairer if the interested parties could have access to that information."

Separately, the Ad Hoc Telecommunications Users Committee is likely to file comments opposing a proposed FCC plan to levy access charges on value-added network providers. "We will almost certainly oppose that proposal," Blaszk said. According to Blaszk, Telenet Communications Corp. believes the proposal will increase weekday rates as much as 100% and weekend rates 500%, increases that will eventually be passed on to users. In addition, he said, his group fears that similar rate increases could, in the future, be levied directly on end users with private networks.

Both the Ad Hoc Telecommunications Users Committee and the TCA are likely to file comments in opposition to the FCC's plan to

drop rate-of-return regulations on AT&T and the Bell operating companies and institute rate caps instead, spokesmen said.

The sixth annual Telecom West Conference and Exposition will take place in Scottsdale, Ariz., Sept. 21-24. The theme of the conference, which is cosponsored by the Building Industry Consulting Service International, Inc. (BICSI), is "New Directions in Telecommunications Design in Buildings." The annual conference is also cosponsored by Arizona State University, Mountain Bell and the Consortium of Telecommunications

Continuing Education.

According to the organizers, the conference provides a forum for discussing the latest aspects of regulation, deregulation, competition, network and distribution systems and other requirements for effective communications systems in commercial buildings.

The first annual meeting of Dialcom Service's Board of Executive Users will be held in Hilton Head, S.C., Oct. 1 and 2. The two-day conference and seminar will include an address by Mark Fowler, former chairman of the Federal Communications Commission. Dialcom, Inc. offers value-added electronic messaging, integrated data base applications and information services. □

Managing consultants

continued from page 19
on one another.

As organizations grow in size and complexity, managers have to understand how to relate to and work with a wide variety of people with a range of backgrounds and skills.

Communications professionals, in particular, must balance the need for business, interpersonal and technical skills. Consultants familiar with these areas can act as facilitators and help develop ways to integrate these seemingly disparate elements smoothly into an organization's ongoing operation. □

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Financial league flourishes

continued from page 19

that most of the group's members join "to take advantage of the educational information WSTA provides on common services, problems, vendors and new products."

The association sponsors monthly meetings to help keep members up to date in the latest communications services, products and applications. "You can't keep up with new communications technologies — everything from satellites to private packet switching to fiber-optic local-area nets — on your own, so the group meets that need," said Milton Aidus, assistant vice-president of communications and technology at PaineWebber,

Inc. and a former president of the group.

"There is a lot of information exchanged between members in the name of better communications. The brokerage business relies on the ability to supply speedy

industry-specific equipment and services. For example, the Wall Street trading houses use trading turrets, which are specially designed phones used by traders. A single trading turret provides direct, point-to-point telephone links for up to 200 separate lines, and frequently more.

The multibutton phones, al-

"You can't keep up with new communications technologies on your own," Milton Aidus said.

and accurate information," Aidus continued. "That is, simply, the nature of our business."

The nature of the finance industry also requires use of specialized,

though extremely expensive to install and maintain, are essential equipment for traders who must be able to reach key customers or other traders at a moment's notice.

The need to access real-time stock market quotations and information is also a brokerage-specific service necessity. This market data is displayed on multiple monitors throughout the trading area. "Trading turrets, market data and even private lines to some extent are requirements that are specific to our industry," Schack said. "But, special equipment aside, the toughest challenge is the industry's demand for better turnaround time."

WSTA was originally founded in 1968 when a group of Wall Street telecommunications managers attending an International Communications Association conference decided to form a group to represent the brokerage community, according to Aidus, a charter member of the organization.

"The original group, which had a nucleus of about seven or eight managers, was formed as an educational group," he said. "We felt there was a need for a forum to exchange ideas, sponsor seminars and have vendor representatives in to talk about new products and services," Aidus continued.

WSTA was incorporated under its current name about four years ago.

The nonprofit group publishes a newsletter, "The Wall Street Ticker," six times a year and makes a membership directory available to facilitate contact and cooperation between managers.

"The competitiveness of the trading world doesn't make WSTA members reluctant to help each other out," Troy said.

According to Lampell, the group has cofounded several users groups. "We've helped establish new users groups to enable us to exchange information with vendors and users from outside the financial community," she said. □

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Dialogue from page 19

“Some people are starting to get cellular phones, and we are starting a project to look at them for certain applications. In one case, there were some renegades who went out and got cellular phones. We recognize that there is a need for cellular phones. The cellular phones will probably be charged to the cost center and will not come out of the communications budget. I don't know whether it's possible to connect the phones to the network.”

Russell Bowen

Director of telecommunications
Aetna Life & Casualty Co.
Hartford, Conn.

“We do use cellular phones, and the money for them comes out of capital expenditures. We have no plans to connect them to the network because we don't use them in that sense. We use them strictly in emergency-type situations when staffmembers need to make phone calls from their cars.”

Gerry Buckley

Telecommunications manager
Raytheon Co.
Missile Systems Division
Bedford, Mass.

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NETWORK WORLD

An IDG Communications Publication

NEW PRODUCTS AND SERVICES

► MACWORLD EXPOSITION

Vendors tie Mac to DECnet, TCP/IP LANs

BY JOSH GONZE
Staff Writer

BOSTON — Third-party vendors at the Macworld Exposition held here recently gave a communications boost to Apple Computer, Inc.'s Macintosh by introducing products allowing the microcomputer to participate in Digital Equipment Corp. DECnet networks and TCP/IP-based local nets.

Technology Concepts, Inc., a Bell Atlantic Corp. subsidiary, released software that enables a Macintosh to communicate with DEC computers via a DECnet Ethernet. Dubbed CommUnity for the Macintosh, the software works in conjunction with Dove Computer Corp.'s FastNet, an intelligent Ethernet controller, to turn a Macintosh into a full-function DECnet end node.

Aimed at what officials at Technology Concepts believe is a large population of Macintoshes in DEC environments, the package provides VT220 or VT240 terminal emulation, remote file transfer and access as well as some net management capabilities. The software is compatible with other packages in the CommUnity family that are used to tie non-DEC products to DECnet networks. In a typical configuration, the products could allow a Macintosh to communicate with DOS or Unix-based computers via DECnet protocols.

Technology Concepts, based in Sudbury, Mass., set the single-quantity price for Macintosh CommUnity at \$400, while Wilmington, N.C.-based Dove Computer will sell its FastNet controller for \$899. The products can be purchased as a package from either company or from value-added resellers.

Elsewhere on Macworld's crowded exhibit floor, Centram Systems West, Inc. unveiled software that lets Macintoshes on an AppleTalk local network communicate with devices on local nets based on the Department

of Defense's Transmission Control Protocol/Internet Protocol.

Called TOPS Terminal for the Macintosh, the program allows Macintosh users to emulate several types of terminals and communicate at 9.6K bit/sec with several hosts through multiple windows. One terminal session can be modem-based to a remote host. Terminal types supported include the VT100, VT52, VT102, ADM3A and teletypewriter.

With TOPS Terminal for the Macintosh, Macintosh users are able to retrieve Unix-based or IBM Personal Computer files from a TCP/IP network and display them as if they were Macintosh files. A remote-edit feature automatically transfers the edited file back to the host machine.

The hardware connection is an AppleTalk-to-Ethernet bridge, such as Kinetics, Inc.'s FastPath. Availability is scheduled for the fourth quarter, and pricing has not been set.

TOPS compatible with Net/One

Centram, which was acquired by Sun Microsystems, Inc. in April, also announced that its Transcendental Operating System (TOPS) networking software is compatible with Ungermann-Bass, Inc. Net/One local networking products. Macintosh users can work with files on an Ungermann-Bass network without actually shifting files from one system to the other.

TOPS is distributed file-sharing software that is compatible with Macintoshes, IBM Personal Computers and Unix-based workstations. The bridge from TOPS to Net/One consists of a nondedicated IBM Personal Computer outfitted with a TOPS board, a Net/One adaptor card, the accompanying software and Version 1.12 of the IBM PC Network. Once the bridge has been installed, the Net/One server can be accessed by devices on the TOPS network. ▣

See inside for:

- UUCP-to-SNADS software
- DEC's Ethernet adapter board
- Fax devices from NEC America

► VIRTUAL SYSTEMS

Software allows PC to be host for 32 terminals

BY JIM BROWN
New Products Editor

WALNUT CREEK, Calif. — Virtual Systems, Inc. recently released software that enables an IBM Personal Computer to act as a host processor for up to 32 terminals or other peripherals.

The firm's Quick Connect software runs on a host personal computer and partitions the host's CPU to support multiple tasks. The product uses a scheduling algorithm to allocate available CPU processing time to terminals connected to the host in a star configuration via RS-232 links.

Terminal users log on to Quick Connect in order to access host applications such as Lotus Development Corp.'s 1-2-3 spreadsheet, WordPerfect Corp.'s WordPerfect and Ashton-Tate's dBase III data base management system.

Terminal users can also send electronic mail messages to other connected terminals and access a shared modem.

Quick Connect is compatible with MS-DOS Version 3.0 or above and supports the DOS Share facility, which provides file and record locking, an ability that enables the product to support network versions of software applications.

With Quick Connect, a network manager creates a user profile for every user linked to the host personal computer. That profile includes such information as user name, password, amount of the host personal computer random-access memory allotted to that user and necessary start-up commands.

When a user logs on, Quick Connect will verify the password and allocate the specified amount of RAM to that user. When a user logs off, Quick Connect automatically makes that user's RAM allocation and other resources available for other users.

Quick Connect will operate with Intel Corp. 8086, 8088, 80286 and 80386 microprocessor-based systems. The firm recommends the use of the 80386's virtual mode for systems designed to serve more than 10 connections. The firm also recommends the use of a hard disk for data storage.

Virtual Systems said Quick Connect will support as many as 32 users accessing applications that have a limited demand on processing time or up to 16 users accessing applications that place a heavier demand on processing time.

The firm also said it will release a version that will support Microsoft Corp.'s OS/2 operating system for the IBM Personal System/2.

Quick Connect will be sold through value-added resellers and distributors. A three-user version has a suggested retail price of \$295, while a version supporting up to seven users will list for \$595. A version supporting eight or more users will list for \$995.

Virtual Systems is located at 1500 Newell Ave., Suite 406, Walnut Creek, Calif. 94596, or call (415) 935-4944. ▣

► MICROCOM

Modem gains high throughput

NORWOOD, Mass. — Microcom, Inc. is introducing this week an asynchronous 9.6K bit/sec modem capable of reaching throughput speeds of up to 11K bit/sec over dial-up lines.

Supporting Microcom's Microcom Network Protocol (MNP) error-checking protocol, the AX/9600 Plus achieves higher throughputs by wrapping asynchronous data in synchronous data packets. That process, a function of Class 3 of the MNP protocol, reduces the number of asynchronous

control characters sent.

The modem also supports MNP's Adaptive Packet Assembly feature, which adjusts data packet size in response to the change in line noise. With this feature, the modem has a maximum data packet size of 256 bytes and a minimum size of 32 bytes.

The AX/9600 Plus also uses Statistical Duplexing, which emulates full-duplex transmission over two-wire lines. A function of MNP Class 6, it allocates more bandwidth to the side of an interactive application that

has the most data to send.

The modem's support for MNP's Universal Link Negotiation feature enables it to establish the highest transmission speed possible automatically with the remote modem. The modem also features adaptive equalization, autodial, redial and autoanswer capabilities. It supports Bell 103 and 212A, and CCITT V.22 and V.22bis standards, and sells for \$999.

Microcom is located at 1400 Providence Highway, Norwood, Mass. 02062, or call (617) 762-9310. ▣

How Wells Fargo leveraged T1 for expansion.

"A part of the rationale in building our network was to position ourselves for expansion," says Bill Stout of Wells Fargo. "It would facilitate our expansion, whether by opening new offices or as the result of the acquisition of another financial institution."

1986 was a year of rapid expansion for this highly successful bank. Fortunately, it already had its N.E.T. IDNX network in place by the time its largest acquisition was announced.

How Wells Fargo positioned itself for additional connectivity requirements.

After the acquisition, Wells Fargo found itself with two additional and complete data centers that had to be integrated with their own private network—a normally complicated task that had to be completed within a tight time frame.

Their N.E.T. network gave them the ability to fully integrate their acquisition's data centers from day one.

How?

"It was a function of the relative ease of expandability and flexibility of the backbone network we had in place," Stout explains. "It was relatively simple to order IDNX equipment and T1 facilities, and have both of these positioned so that we could provide immediate connectivity."

With the T1 network in place and the IDNX to channel capacity on demand, Wells Fargo was spared inordinate amounts of time and expense for building individual application connections.

Says Stout, "Our network did a lot to keep us in front of our users' needs last year."

How *you* get more network leverage with N.E.T.

With N.E.T., you focus *more* on leveraging network capabilities and benefits and *less* on installing and running your network.

And you reap such productivity advantages as superior applications availability, greater uptime, and sure-fire connectivity.

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Says Wells Fargo's Stout, "One of the benefits of our network is its extensibility. The network became an integral part of our corporate strategy for expansion."

When you evaluate how to get *best* advantage out of T1, remember this:
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Hot topics coming your way this summer in Network World.

September 7: IBM SPECIAL

IBM's open architecture strategy may be a boon to users and software vendors only if they are willing to play "follow the leader" with Big Blue. Readers will get the facts from this Special Section.

September 14: PACKET SWITCHES

Packet switching can be a sensible, money-saving technology for many data network professionals. And this Product Focus gives users the full story.

September 21: T-1 SERVICES

T-1 service is still a hot topic among managers who have high-volume transmission needs, but whether users are getting the most bandwidth for their buck is still unanswered.

September 28: OPEN SYSTEMS — IBM TCA SHOW ISSUE

Just how open are IBM's open systems? *Network World* takes a hard look at Big Blue. And September 28 is also our TCA Show issue — with bonus distribution and detailed coverage of the show.

October 5: GATEWAYS AND BRIDGES

Both users and suppliers will learn which gateways and bridges connect with which vendor networking environments in LANs, WANs and MANs. Plus, *Network World* wraps up the TCA show.

Every week *Network World* reports on important and timely issues from a networking perspective — a unique perspective that voice and data communications users need. That's why more than 65,000 communications/networking buying decision makers rely on *Network World* for the news and information that makes a difference to them.

For information on advertising call Ron Mastro, National Advertising Director at (617) 879-0700.

NETWORK WORLD

An IDG Communications Publication

First Look

MS-DOS call-accounting software, call recorder out

Sykes Datatronics, Inc. released three call-accounting packages for MS-DOS-based personal computers and a call detail recorder.

Comm-Traks 500, 700 and 700 Plus call-accounting packages are designed to monitor and audit telephone use on as many as 2,500 lines. All three packages enable users to generate reports from the 11 fields of data stored for each call. The fields include date, time, duration and cost of the call; the extension and trunk used to place the call; the dialed number; and the department, account or authorization code. The package identifies up to 10 area codes by city and state. The package's batch-reporting capability supports multiple report generation, and a graphic-reporting feature produces histograms of daily telephone usage.

In addition, **Comm-Traks 700** supports full city and state identification of all area codes and exchange prefixes as well as a historical data program that summarizes call activity for trend reports. **Comm-Traks 700 Plus** adds a data base management capability, which enables users to create ad hoc queries and reports based on stored call information.

The firm's board-based **Call-Watch Tip and Ring Scanner** collects call detail data from private branch exchanges, key systems or Centrex systems that do not support station message detail recording. A wall-mounted version accommodates five boards, each of which supports 48 lines, for a total of 240 lines. A rack-mounted ver-

sion supports up to 720 lines.

CallWatch Scanners detect incoming and outgoing calls and pass call records to Sykes Comm-Store 530 storage devices via an RS-232 link. That storage device is polled by a modem attached to a personal computer running **Comm-Traks 1000 Call Management** software.

Comm-Traks 500 is priced from \$1,695 to \$3,845. **Comm-Traks 700** is priced from \$1,995 to \$12,495, while **Comm-Traks 700 Plus**, which includes a data base management package, ranges from \$3,395 to \$13,940. A single-board **CallWatch** costs \$2,000.

Sykes Datatronics, Inc., 375 Orchard St., Rochester, N.Y. 14606, or call (716) 458-8000.

Unit controls remote A/B switches

Data Switch Corp. introduced a unit designed to control remotely located A/B, monitor or bypass switches made by its subsidiary T-Bar, Inc.

The **Model 4990 Remote Control Unit** provides remote access to monitoring and test functions and displays alarms received from remote switches. The unit has two RS-232 ports that support a terminal connection or communications with a host computer. The 4990 controls up to 256 lines of A/B, monitor or bypass switching. It also controls 256 lines of T-Patch A/B switching or a combination of these features to support up to 512 switched lines. It reports alarms detected by remote T-Patch A/B switches and provides an alarm map that warns operators of alarm conditions detected by the switching systems. The unit costs \$2,000.

Data Switch Corp., 1 Enterprise Drive, Shelton, Conn. 06484, or call (203) 926-1801.

PRECISION SOFTWARE, INC.

Phone banking debuts

BY JIM BROWN
New Products Editor

ST. PAUL, Minn. — Precision Software, Inc. recently announced a personal computer-based voice response system designed to enable customers of financial institutions to access account information and other banking services via a push-button telephone.

With **HomeBranch**, customers can transfer funds from savings to checking accounts, authorize bill payments, inquire about account status and retrieve interest rate quotes. Remote personal computer users can access the system at 2,400 bit/sec over dial-up lines to do loan applications and account statements.

The system is based on an IBM Personal Computer AT-compatible and supports up to 24 incoming telephone lines. **HomeBranch** col-

lects customer-entered data and passes it on to the financial institution's host through a terminal-emulation utility. The **HomeBranch-to-host** link is completed via direct connect or RS-232 cable.

Customers dialing into the unit from a telephone are greeted with a prerecorded voice message. Subsequent messages prompt users to enter their personal identifications and ac-

count numbers using their telephone key pads. The system's voice prompts the users to enter the required information.

Once compiled, the system passes the transaction to the host via terminal emulation. The host transmits a response to **HomeBranch**, which then compiles the appropriate spoken message from a list of stored message phrases. The customer also has the ability to transfer to a live operator.

Personal computer users can dial into **HomeBranch** using a communications package such as **Smartmodem**.

Package links Unix's E-mail facility to IBM SNADS

Communications Solutions, Inc. (CSI) introduced software that links the Unix-to-Unix Copy (UUCP) electronic mail facility to IBM's Systems Network Architecture Distribution Services (SNADS).

UUCP/Connect converts UUCP messages to SNADS messages. It enables a Unix user to send UUCP E-mail messages to local or remote SNADS or UUCP users. The product supports forwarding of E-mail to IBM-compatible Office System Nodes and enables users to utilize a SNADS network without translating between UUCP and SNADS. It is designed to be used in conjunction with CSI's Access/SNADS and costs \$25,000.

Communications Solutions, Inc., 2125 Hamilton Ave., San Jose, Calif. 95125, or call (408) 559-1118.

DEC releases new Ethernet adapter board

Digital Equipment Corp. released an Ethernet local-area network adapter board enabling DEC VAX 8000 series minicomputers to link directly to IEEE 802.3-compatible Ethernets.

Each VAX 8000 system is capable of supporting up to four VAXBI bus-based boards, enabling the system to link to four different Ethernet nets running IEEE 802.3-compatible software or DECnet software. The board enables the VAX 8000 systems to connect directly to a Local Area VAXcluster, which is a software and hardware combination enabling up to 13 VAX systems to appear as one logical system.

The board is priced at \$5,000.

Personal computer users can dial into HomeBranch using a communications package such as Hayes Microcomputer Products, Inc.'s Smartmodem. The remote user selects applications from a menu of options and enters the data needed to compile a transaction. HomeBranch then sends the host's response to the remote personal computer.

The system comes with a 40M-byte hard disk, about 6M bytes of which is typically used to store prerecorded voice messages. The system requires 3K bytes of memory for each second of recorded speech.

HomeBranch also provides audit trails that determine how busy the lines are as well as which customers have called in and which applications have been accessed.

A four-line system sells for between \$25,000 and \$26,000, while the cost for each additional four lines is \$6,000. The system price includes the terminal-emulation hardware and software needed to access the host.

Precision Software is located at 80 E. Little Canada Road, St. Paul, Minn. 55117, or call (612) 484-5501. □

Digital Equipment Corp., 146 Main St., Maynard, Mass. 01754, or call (617) 897-5111.

NEC America Introduces two new fax machines

NEC America, Inc. announced a pair of facsimile devices that can be used stand-alone or in a network of facsimiles.

Both the **NEFAX-20** and desktop **NEFAX-14** are equipped with a 9.6K bit/sec modem. The units are compatible with other CCITT Group 2 and Group 3 facsimile machines, and they can be made compatible with CCITT Group 1 units through optional equipment. The NEFAX-20 transmits a page to oth-

er NEFAX-20s in 12 sec and to other CCITT Group 3 facsimile devices in 20 sec. The NEFAX-14 transmits a page to other NEFAX-14s in 15 sec and to other CCITT Group 3 facsimile machines in 30 sec.

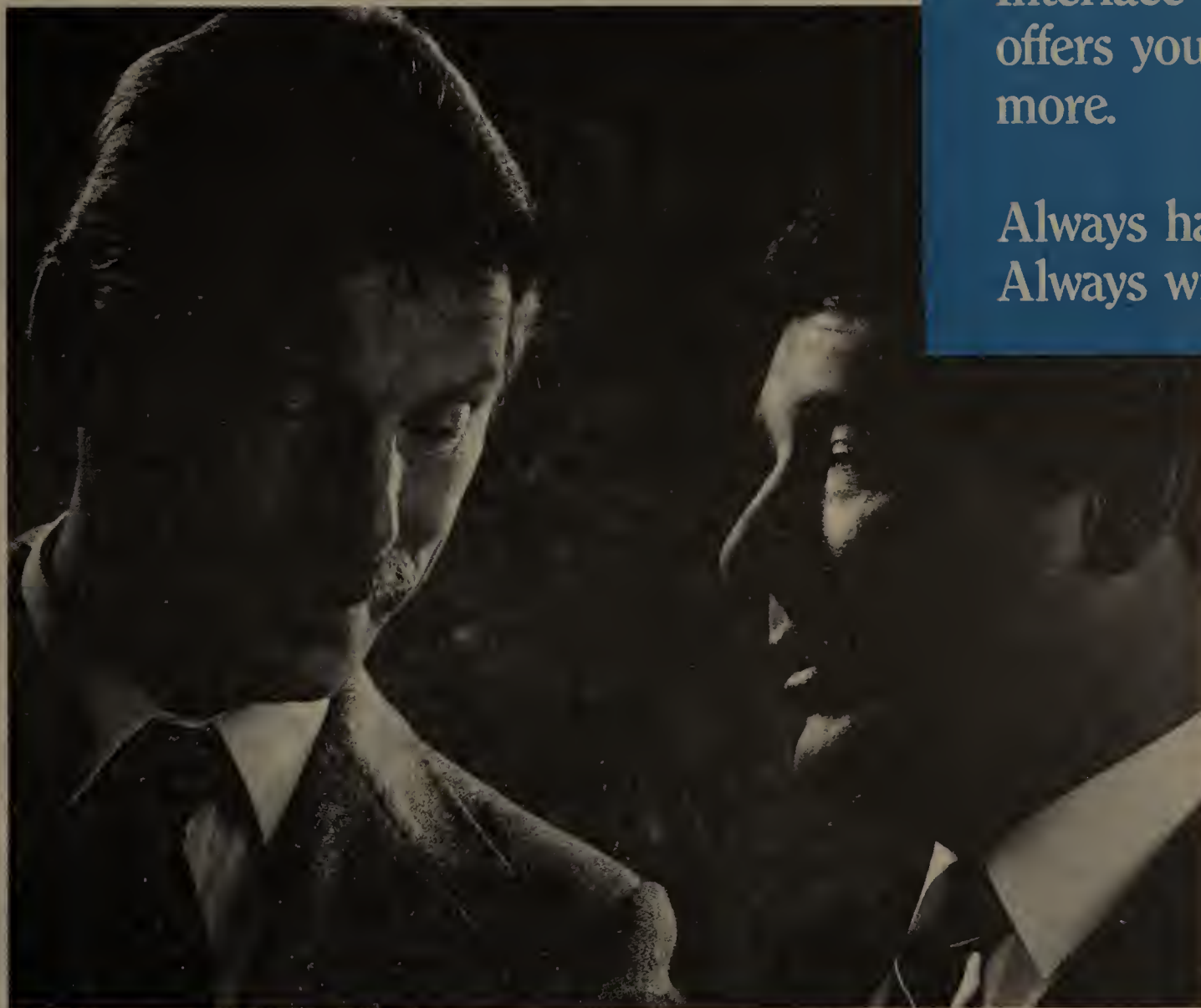
The NEFAX-20 is capable of one-button dialing of up to 20 stored numbers. It also supports abbreviated dialing, which enables operators to dial up to 100 locations by touching two buttons. The NEFAX-20's programmable 4M-bit random-access memory supports unattended operation, which enables users to program the device to transmit at night when telephone rates are less expensive. The memory also enables the unit to poll up to 100 facsimile network locations.

The NEFAX-14 supports an abbreviated dialing feature for up to 50 numbers and is able to poll up to 50 facsimile network locations. It can also double as a copier.

Both units feature a transmit-receive function, which enables operators to program the units to transmit outgoing documents once the unit has completed receiving an incoming document. Both units also support management reports that include detailed summaries of activity.

The NEFAX-20 costs \$3,395, and the NEFAX-14 is priced at \$2,595.

NEC America, Inc., 8 Old Sod Road, Melville, N.Y. 11747, or call (800) 782-7329; in New York state, call (516) 753-7406. □



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NW 82487

Opinions

The Federal Communications Commission has signaled its intention to impose carrier access charges on providers of interstate enhanced

services. This proposal is ill-advised. It could chill demand for enhanced services and adversely affect users.

Under the FCC's current access charge rules, enhanced service providers and end users aren't required to subscribe to interstate Feature Group access service. Instead, they may use ordinary local exchange service.

Pursuant to the FCC's rules, when enhanced service providers and end users utilize this service to originate or terminate interstate, inter-local access and transport area traffic, they already pay for such usage, implicitly or explicitly, through long-distance and WATS rates or through the Special Access Surcharge, also known as the "leaky private branch exchange" charge. The FCC now suggests that enhanced service providers, but not end users, must subscribe to and pay for interstate Feature Group access service.

The FCC's proposal could increase enhanced service providers' costs by as much as \$5 per hour. An endless list of services would suffer higher operating costs under the FCC's proposal, including remote access data processing vendors, data base retrieval suppliers, bulletin boards, electronic mail services, credit verification operations and value-added networks.

To think the FCC's proposal would not adversely affect end users is to ignore fundamental business realities. If the FCC proposal is adopted, enhanced service providers would be forced to accept much lower profit margins or raise their prices to pass the higher access charges on to their customers.

There seems to be no basis for assuming that demand for enhanced services is stable. Therefore, enhanced service providers may experience a drop in business and lower profits.

End users, of course, will also be affected. If they confront higher prices from enhanced service providers, they naturally will be forced to evaluate alternative network configurations and different means to accomplish the same tasks. Some may expend major capital on in-house DP capabilities. Even if DP isn't moved in-house, capital could be committed to hardware solutions aimed at reducing connect times, such as

Blaszak is an attorney specializing in telecommunications law at Heron, Burchette, Ruckert & Rothwell in Washington, D.C.

PRO:

BY JAMES S. BLASZAK
Special to Network World

higher speed modems. These would be costly and unnecessary but for the FCC's proposal.

The uncertainty created by the FCC's latest ac-

cess charge spasm also imposes another kind of cost on end users. Until the FCC takes final action on its proposal, end users cannot make informed judgments about subscribing to enhanced services or effecting hardware or network configuration solutions. The telecommunications environment is chaotic enough without an unnecessary perturbation.

Lastly, some carriers and enhanced service providers will argue that end users should be required to subscribe to Feature Group access service in lieu of utilizing leaky PBX configurations. While such arguments are misplaced, end users nevertheless

See **Pro** next page

The proposed increase in access fees for enhanced network services must be examined from both provider and user perspectives if its impact

is to be determined. Having taken such a view, it becomes apparent that the short- and long-term impacts of the proposed regulation on both users and vendors will be small. How critical the impact will be on provider revenues depends on the business situation of each value-added network (VAN), other common carrier and application provider.

As stated in the Federal Communications Commission's Notice

Braudy is vice-president of Quantum Consultants, Inc., an information technology consulting firm and subsidiary of The Quantum Group International in New York.

CON:

BY ROBERT S. BRAUDY
Special to Network World

of Proposed Rule Making (CC Docket No. 87-215), the intent of the proposal is to ensure that cost recovery for local exchange

access be equita-

bly borne by all classes of users. Consequently, an access fee is proposed based on use of the interstate public communications network for enhanced services.

VANs have the option of absorbing that access fee or increasing their rates. While their strategies remain to be developed, it's likely the VANs will pass on the entire charge directly to the user.

The question remains whether users will decrease their requirement for on-line access to applications such as data base search, information retrieval and electronic mail. Overall, the business world's thirst for information will not be significantly affected by the proposed rule-making.

Public data networks offered by some local exchange companies will remain exempt from the cost-recovery mechanism.

An organization with a private network could minimize the impact of the proposed regulation by placing a network node in the same state and local access and transport area as that in which the application supplier has its computer center. Smaller organizations cannot develop such a network cost-effectively.

To assess the impact of the proposed regulation on data base providers and other application providers, the four principal segments of the user market must be considered separately. First, business users can pass the increase directly on to customers. Prime examples are professional information search firms, lawyers and companies that offer credit authorization services. The application and VAN suppliers used by this segment will remain unaffected by the regulation.

The second segment comprises organizations that can charge back indirectly for access to application providers. Indirect chargeback may be considered as a general increase in the overhead of conducting business. Examples of organizations in this group, which will be minimally affected, are research libraries within major corporations and some professional service firms.

Non-revenue-generating organizations such as public, medical and academic research libraries are the third segment. They typically have fixed budgets for reference work and therefore must trade off the cost of reference searches against the number of searches and the means of performing the research. The impact of the proposed regulation on these organizations will probably not be severe. Given the cost of

Will VAN access charges chill demand for enhanced services and adversely affect users?

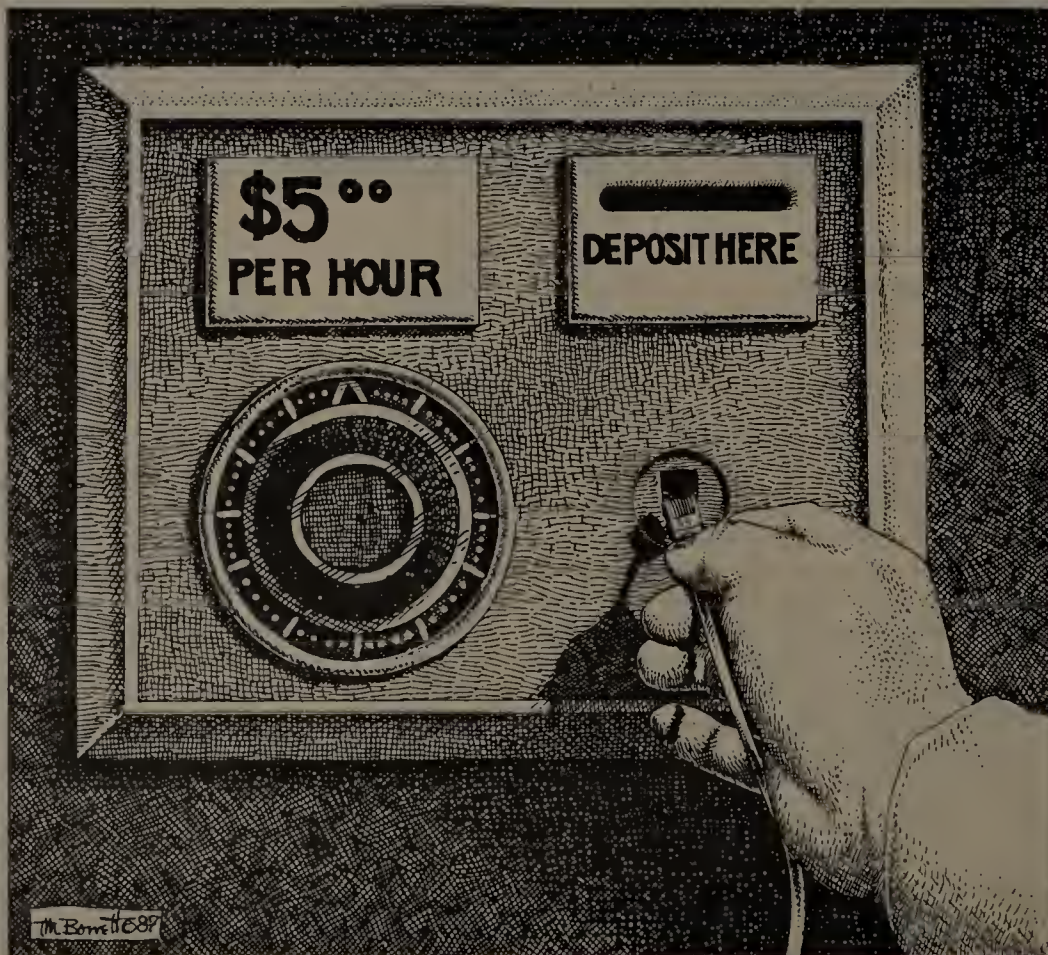
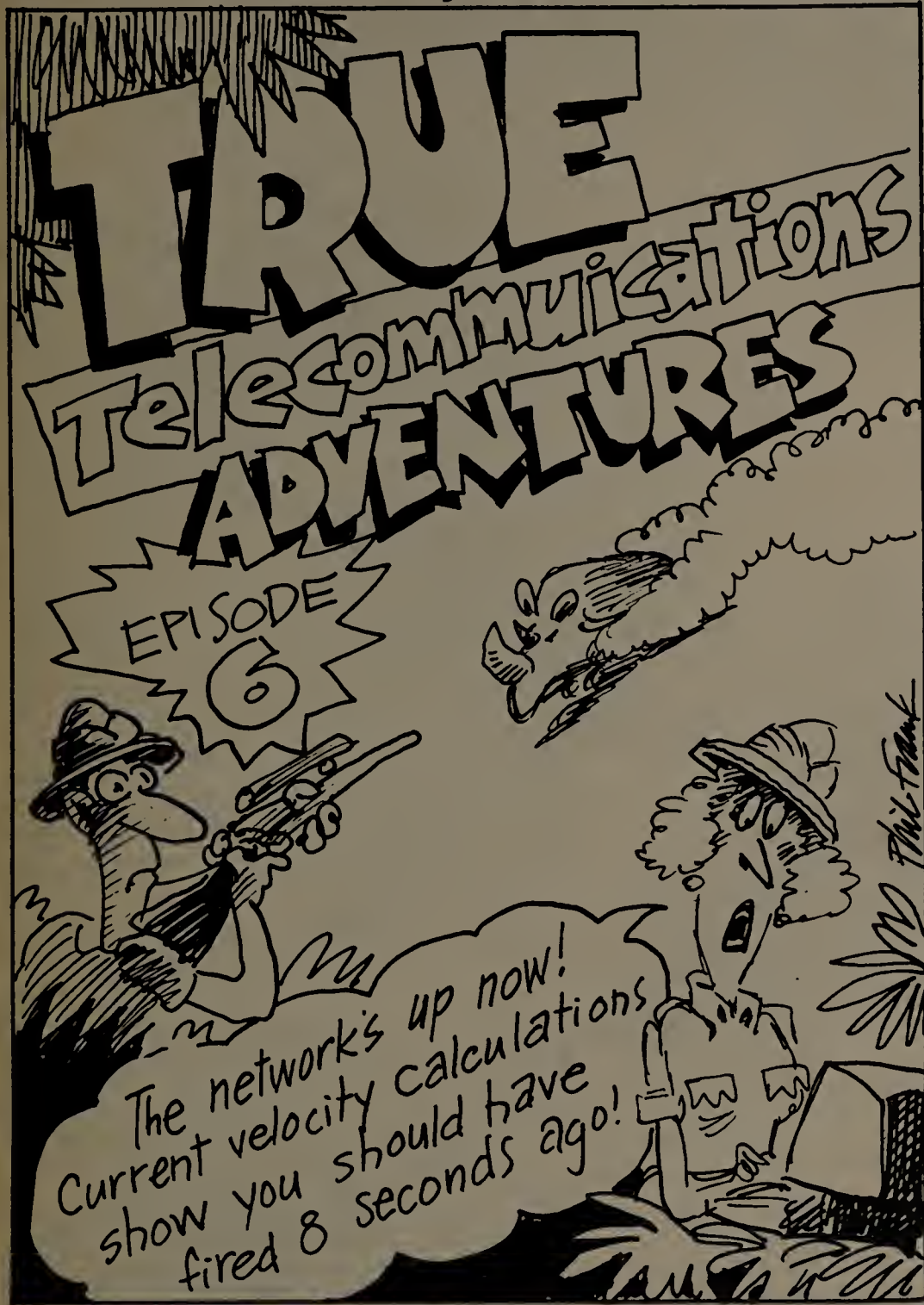


ILLUSTRATION © 1987 TOM BARRETT

Opinions

► **TELETOONS — By Phil Frank**



data base search, the cost of VAN services and other costs of performing on-line research, the discussed \$5-per-hour new access fee would increase costs on average by no more than 10%.

The consumer represents the fourth user segment. Applications that might be impacted are information retrieval and electronic mail. Home banking would not be greatly impacted since, in today's environment, home banking is most often performed on an intrastate rather than interstate basis. Given the financial well-being of the average user of on-line personal computer services today, the access fee will not be a burden and will not cause them to modify their on-line usage.

In summary, businesses will be affected to a minimal degree by the proposed access fee. In the long run, if the access fee is implemented, VANs and application providers will, from competitive necessity, develop new product and service features. These features will effectively decrease on-line access time, increase the "user friendliness" of their network and search techniques, and support new applications so that revenue growth may be sustained. ▢

Pro from previous page must understand that they also could be directly swept into the FCC's rule changes.

While the FCC's proposal could be devastating for enhanced service providers and end users, it would not produce any significant, positive countervailing effects. Some have suggested that the current carrier charge imposed on long-distance carriers would decline by a trivial amount — perhaps by as little as one-tenth of a cent per minute — if the commission adopts its proposal. This change would produce no perceptible impact on long-distance rates.

Thus, residential consumers wouldn't see noticeably lower long-distance rates but would see markedly higher prices for consumer-oriented information services. This would occur at the same time the FCC is so concerned about facilitating the widespread availability of information services.

The enhanced services industry is alarmed over the prospect of being subjected to mandatory carrier charges. End users too are at risk. Enhanced service providers and large end users should work together to thwart this effort to turn their world on its head. ▢

OPEN SYSTEMS

GEORGE NEWMAN

A few good users

Landing itself smack in the middle of the highly charged and controversial environment of standards development, the Corporation for Open Systems (COS) has inadvertently become a slow-moving target for industry watchers bored with IBM-bashing. With the dynamic and volatile communications market as a backdrop, COS' actions to date have appeared to be particularly lacking in excitement.

Organizationally, however, COS has made some important moves in the last 12 months. Its most recent action was the establishment of the affiliate associate membership category to help entice more end users into COS. The very reasonable fee of \$500 per calendar year entitles nonprofit user organizations to access COS' technical and informational data bases as well as attain certain levels of involvement in the COS organizational structure.

The current level of involvement for affiliate associates is limited to putting forth a user position paper to be reviewed by COS' Strategy Forum. The Strategy Forum is a policy-making body that recommends overall technical direction for COS. It will respond to the position paper through the COS newsletter and adopt or reject proposals as it sees fit. Annual workshops will be set up to provide affiliate associates with the means to interact with leaders of various COS subcommittees.

Eight user organizations have already joined the affiliate associate program: the Association of Data Processing Service Organizations, the Institute for Defense Analysis, the Computer and Business Equipment Manufacturers Association, the Network Users Association, the National Association for State Information Systems, the Network Computing Forum, Research Libraries Group and the University of Minnesota.

Nonprofit users are not excluded from joining as full members if they are willing to pay the relevant membership fees. Of course, the minimum \$25,000 annual fee may limit participation by smaller groups.

Newman is editor of the Communications Industry Report for International Data Corp. in Framingham, Mass.

The U.S. Army Information Systems Command, Morgan Guaranty Trust Co. of New York (a subsidiary of Morgan Bank) and the National Communications System are examples of regular members. And the National Bureau of Standards (NBS) has issued a statement outlining its intention to negotiate the best form of representation for NBS in COS.

Many users remain skeptical. Those most intimately involved in running private data and telecommunications shops don't have the time or money to join COS. Many are loath to be dragged through the politics and drudgery of what they view as "another standards committee." Many groups do not have the staff time to spare.

A measly fee

A measly \$500 affiliate associate fee is not much to spend in order to be kept informed of COS activities. Users may cry for standardization and all the wonderful benefits that are supposed to go along with it, but they seem to want it for little investment and minor disruption of the everyday work flow.

Users must not allow standards and conformance tests to be set in a "vendor vacuum." They must put themselves into the front lines of standards and conformance test development.

Users cannot afford to sit on the sidelines now, only to complain years later when products are not up to snuff. COS has become an essential component in the standards-setting process. Companies and users groups should at least join COS as affiliate associates if they truly wish to get out from under single-vendor dependence and gain control of their destiny. They must also exercise patience, because the tasks facing COS are by no means small.

If affiliate associates find their forums to be ineffectual, they have the option of regular membership. Other options will probably become available to users as COS reviews its own performance and operational structure.

It will be a long, complicated evolutionary process, but the potential benefits of transparent multivendor connectivity will surely outweigh any of the difficulties. ▢

Features

August 24, 1987



Special Section: Network security

Policing data pathways

BY LAWRENCE STEVENS
Special to Network World

Last year, a superminicomputer used by a financial service bureau was illegally accessed by at least four people around the country. The computer had a number of electronic mailports that were protected only by the fact that their 800 numbers were unpublished.

The perpetrators accessed data files of a large financial institution that was connected with the minicomputer. They gathered information about the institution's clients during the week and used that information to their advantage when trading stock the following Monday. The only hint the service bureau had that data was being compromised was a sudden increase in the number of bytes being transmitted through its system.

Belden Menkus, a Middleville, N.J.-based network security consultant, was called in by the service bureau to help. "It's hard to believe that such a large company wouldn't include strong security measures when implementing its network," Menkus says. "But un-

Stevens is a free-lance writer based in Springfield, Mass.

This primer
unlocks the
special security
needs of
networks.

fortunately, most of my clients, large and small, decide to secure their networks only after a breach has occurred."

According to Menkus, there are three major objectives of any security system: minimize the chances of a break-in; ensure that if a break-in does occur, it will be detected early; and be prepared to reconstruct data that was attacked.

Network securing techniques

The most widely used techniques for securing a network are encryption, authentication and access control.

Encryption minimizes the chances of a break-in by rendering data unintelligible to anyone who

doesn't have keys to the encrypting (coding) and decrypting (decoding) mechanisms. The code may substitute one piece of data for another, or it may use transposition, which changes the order of the data in some specific manner. In either case, the key, which may be contained on a microchip, provides the means for data to be encrypted on the sending end and decrypted on the receiving end.

Besides protecting transmission privacy, encryption can also detect a break-in because any alteration of the data will result in the receiver getting a garbled message.

According to Glenda Barnes, vice-president of standards and policies at Bank of America National Trust & Savings Association, one of the most important considerations when developing an encryption program is to follow an ANSI standard or another accepted standard. She says, "We are often involved in litigation. Our best defense when we are being sued for a breach of security is that we followed an accepted standard."

10-year-old standards

In 1977, the U.S. Bureau of Standards issued its Data Encryption
Continued on page 33

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1. On the official entry form, clearly print your name, title, company name, address, zip code and business telephone number. All information must be provided in order to qualify as a contestant. Affix postage and mail. Entrants are not required to register to attend Communication Networks '88 in order to enter the contest.

2. All entries must be received by midnight, November 30, 1987. Contest drawing will be held December 4, 1987. Communication Networks is not responsible for entries delayed, late, mutilated or lost in mail. Odds of winning are dependent upon the number of entries received. Only one entry per person. Entries become the property of Communication Networks.

3. One (1) Grand Prize, one (1) First Prize, one (1) Second Prize and one (1) Third Prize will be awarded. Winners will be selected at random. All prizes will be awarded and winners will be notified by phone. Only one prize per individual. Prizes are non-transferable and no substitutions or cash equivalents will be allowed. Winners will be required to provide consent for use of their name and picture in advertising and publicity.

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Contest sponsored by Communication Networks.

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Standard (DES), which provides for a fixed scrambling algorithm that varies with the key. Using this model, which is still in broad use, cleartext (unencrypted data) is entered into the encryption device and is divided into 64-bit blocks. Simultaneously, a 64-bit key applies substitution and transposition techniques to the text, thus encrypting it. At the receiving end, the key is used to restore the ciphertext (encrypted data) to cleartext.

A more complex and more secure version of the DES involves the encryption device simultaneously sending a third set of data, which transposes the 64-bit blocks in such a way that each block is encrypted differently. The DES also alerts users if a break-in has occurred during transmission. If there is a change in just one bit, the decrypted message will contain at least 50% errors.

The National Security Agency (NSA) announced in 1986 that it would no longer certify network security equipment for compliance with the DES. Feeling that age is making the DES more vulnerable, the NSA now supports a plan to use a multitude of algorithms from which users can pick and choose. This strategy would reduce the amount of data protected by any one algorithm ("Death of a standard," *NW*, Aug. 17).

Link vs. end-to-end

Encryption can be either link or end-to-end. In link encryption, the message is decrypted and re-encrypted as it passes through each node of the network; in end-to-end encryption, data is sent from source to destination in encrypted form. According to Joel Zimmerman, a consultant with Computer Security, Inc. in Williamsburg, Va., each of these techniques has advantages.

With link encryption, a security break in the key of one node doesn't compromise the entire system. Second, idle nodes can be continuously fed a stream of unimportant ciphertext for camouflage purposes.

End-to-end encryption simplifies key distribution, creates fewer encrypting/decrypting operations — thus reducing the danger of a security break or errors — and makes cost apportionment among users easier. Zimmerman and others believe end-to-end is the best approach for most networks.

Encryption systems comprise either software or, more commonly, hardware black boxes. The average box costs between \$2,000 and \$4,000, but systems costing as little as \$400 per node are becoming available. Systems may be either on-line or off-line.

On-line systems, the most common, sit between the terminal, or host, and the modem, or communications device. These provide end-to-end or link encryption.

Off-line systems use a device that converts cleartext into a ciphered message on a medium such as punched paper tape. The medium can then be delivered manually

or sent by electronic means. The message is decrypted at the receiving end by a similar device. Other types of off-line encryptors include handheld and microcomputer expansion board encryptors.

Authentication, unlike encryption, does not protect against eavesdropping because all messages are sent in cleartext. However, attached to the cleartext as a line of encrypted text is the "authentication field." If the message is a funds transfer, the authentication field might contain the number of dollars involved added to the date. A transfer of \$2,342,000 transmitted on Nov. 20 could have an authentication code of 3462: 1120 (the date) + 2342 (the amount in thousands of dollars). If

the decrypted authentication field doesn't equal the related data, an error or a security break is assumed.

Since the processes of encryption and authentication are similar, most systems can perform both functions, and the cost is usually the same. George Thomas, vice-president of operations at the New York Clearing House Association, says that, in installations where viewing the data will not compromise security, authentication is a more reasonable approach than encryption.

"Encryption creates problems in data transmission that make it really undesirable unless data privacy is absolutely necessary," Thomas says. "The main problem

is that if there is even a small error in transmission, all the data in that transmission will decrypt and you'll end up with garbage. Multiply the number of times that happens each day and figure how much all the retransmissions cost, and you'll see the scope of the problem.

"Many people choose encryption without analyzing their situation to see if they really need it," Thomas continues. "The main consideration should be whether an outsider viewing the data is a threat to the organization."

The success of encryption or authentication depends on how well the keys are managed. Keys must be created, assigned, distributed

Continued on next page

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From previous page and canceled in a way that minimizes the possibility of their falling into unauthorized hands.

The most common form of key distribution is simply sending the key physically to each site, normally in the form of a microchip, by bonded messenger, certified mail or other secure means. Keys have to be changed regularly, and the receiving group should not know when the key will be changed.

A more secure means of manual key distribution is to deliver only preliminary keys to different individuals. Two or more of the preliminary keys must be placed in the encryption device to generate the true key. In this way, the true key is never seen.

The major disadvantage of manual key distribution is that it becomes cumbersome when many terminals are serviced or when keys have to be issued daily or even more often. Automatic key management, while more expensive, allows for the creation of keys as often as an organization deems necessary. Keys are downloaded from the host computer on a regular basis.

Bank of America's Barnes says, "The best key management is automatic. No one knows about it. It is transparent, and no one is tempted to be dishonest."

Keep off the nodes

While encryption and authentication protect the data en route, they do not protect unauthorized use of nodes that may contain the key. In order to control access to these nodes, Menkus points out some simple precautions.

Idle terminals should be disconnected and the host programmed to refuse any transmission from them. Also, the host should cut off a terminal if too much time elapses without any input after it requests a user password.

Passwords should be changed frequently, and they should not be based on personal data that can be traced, such as a child's name or a birthday. Passwords should not include words commonly found in dictionaries, because these may be broken using programs that modify spell-checking software.

A new means of preventing unauthorized use employs biometric control devices that "read" users' physical characteristics, such as fingerprints, and match them with user data from its data base. Only us-

ers whose physical characteristics are authorized to gain access are allowed to log on.

Access and security problems and solutions often depend on the network topology. For example, in a star network, in which all traffic goes through the host, only three nodes

topology, more nodes may be involved in any transmission, widening the possibility of a security break.

Another factor to consider is whether a local network is broadband or baseband. Broadband networks have more complex signals, and eavesdropping on them is therefore more difficult.

access-control software. Such packages provide a means of verifying the access authority of those who try to use the system. The software intercepts users' requests for system access and verifies their passwords and identifications. Users' IDs determine their level of system access.

protecting data must be considered with any type of network, direct-wired networks such as local-area nets present special problems: Terminals as well as cabling must be protected.

Cables should be kept in secure areas. If necessary, cables can be sheathed in heavy metal casing to deter intrusion. Sheaths with a positive gas pressure are also available. The pressure is monitored from a centralized location. If the sheath is broken, the pressure is reduced and an alarm is issued. Shielding devices are also necessary to thwart listening devices that can pick up signals emanating from most cables.

Finally, an audit trail should be in place so that, if a break does occur, all activity on any node can be documented and the progress of any transaction can be traced throughout its lifetime. The easiest way to keep an audit trail is to have the computer keep a "snapshot" of each transaction. The snapshot should contain the date and time the transaction was entered or delivered; a terminal and system sequence number; originating or destination department; operator ID (but not password); message length; and a description of the message's route.

Snapshots should be kept for an appropriate length of time. This time period depends on data sensitivity, the relative difficulty in reconstructing the message and the likelihood that security procedures will discover an attack quickly.

Because storage can be expensive, cost and risk analyses should be used to determine what is best for each organization.

Depend on yourself

According to Menkus, network vendors generally do not provide security devices. Network security, he says, is often not considered until long after the network has been installed, and vendors leave security needs up to the communications manager to discover.

"Look at any comparison charts for networks," Menkus says. "There is never any discussion of security features. Putting a security feature on a network product adds to its cost, but in general, those features are not considered when making purchasing decisions. As long as this is the case, users are going to have to make their own network decisions and buy security products separately." □



should ever handle any transmission: the sending node, the receiving node and the hub or host. This reduces potential points of attack.

However, a star network requires strenuous security to protect the host, since all transmissions go through it. In a bus or hierarchical

On the other hand, an attacker who successfully breaks into a broadband network is usually rewarded with more information than one who gains access to a baseband net.

Protective measures

One method of protecting a star network is to use

To prevent guessing by would-be intruders, some systems limit the number of incorrect access attempts by logging off after a certain number of bad guesses and reporting the user's ID to the security administrator.

While preventing unauthorized terminal use and

Special Section: Network security

Protecting the multitudes

Continued from page 1

and tends to increase with changes of network components or user communities.

As a general rule, security components that define and control each network element are easier to implement in a single-vendor network. In an IBM network, for example, multiple copies of Top Secret and ACF2, both made by Computer Associates, Inc., and

Multivendor environments provide multilayered challenges to security.

IBM's RACF or other security software might be needed because of a corresponding multiplicity of copies of the operating system. In such a system, each product works

Continued on next page

O'Leary is an independent computer security consultant based in Plano, Texas.



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in a consistent way throughout the network. Security administration is manageable in this type of environment.

In multivendor networks, a nucleus of large mainframes (such as IBM 30XX devices) may still exist, but surrounding it and connected to it are any number of boxes that say Burroughs or Tandem or Stratus or something else on the side.

At the other ends of communication lines (whether they are microwave, satellite, fiber-optic or cable) are more of these non-IBM things, and an ever-increasing variety of terminals and personal computers are connected to these devices in strange and exotic ways.

Vendor philosophies

With many different vendor products in a network, the data security officer has to contend with varying philosophies of security. Even if vendors classify security up there with God, motherhood and apple pie, they might approach the subject differently — one focusing on individual access and accountability, another aiming more for control at the resource level; one providing granularity of control down to the field level

In multivendor networks, a nucleus of large mainframes may still exist, but surrounding it and connected to it are any number of boxes that say something else on the side.

within a record; while another allows control only down to the primary file or data base and does not differentiate individual records or file members.

Such systems may set hierarchical levels of control, showing users a menu indicating only what their passwords and clearance allow them to access in the system. Some vendors assume security will be added on via an additional hardware or software product, and they engineer into their wares a basis for imposing desired controls.

Unfortunately, some vendors view security as unnecessary overhead and design their systems accordingly.

For example, one system with an override feature was designed to limit access to sensitive information. Unfortunately, users could call up the override screen from

the main menu and give themselves access to the sensitive information at any time.

If auditors or data security officers have sufficient organizational clout, they can influence hardware

and software acquisition decisions and prevent weaker links from ever being chained into the network. Realistically, though, price, performance and organizational politics will probably outweigh se-

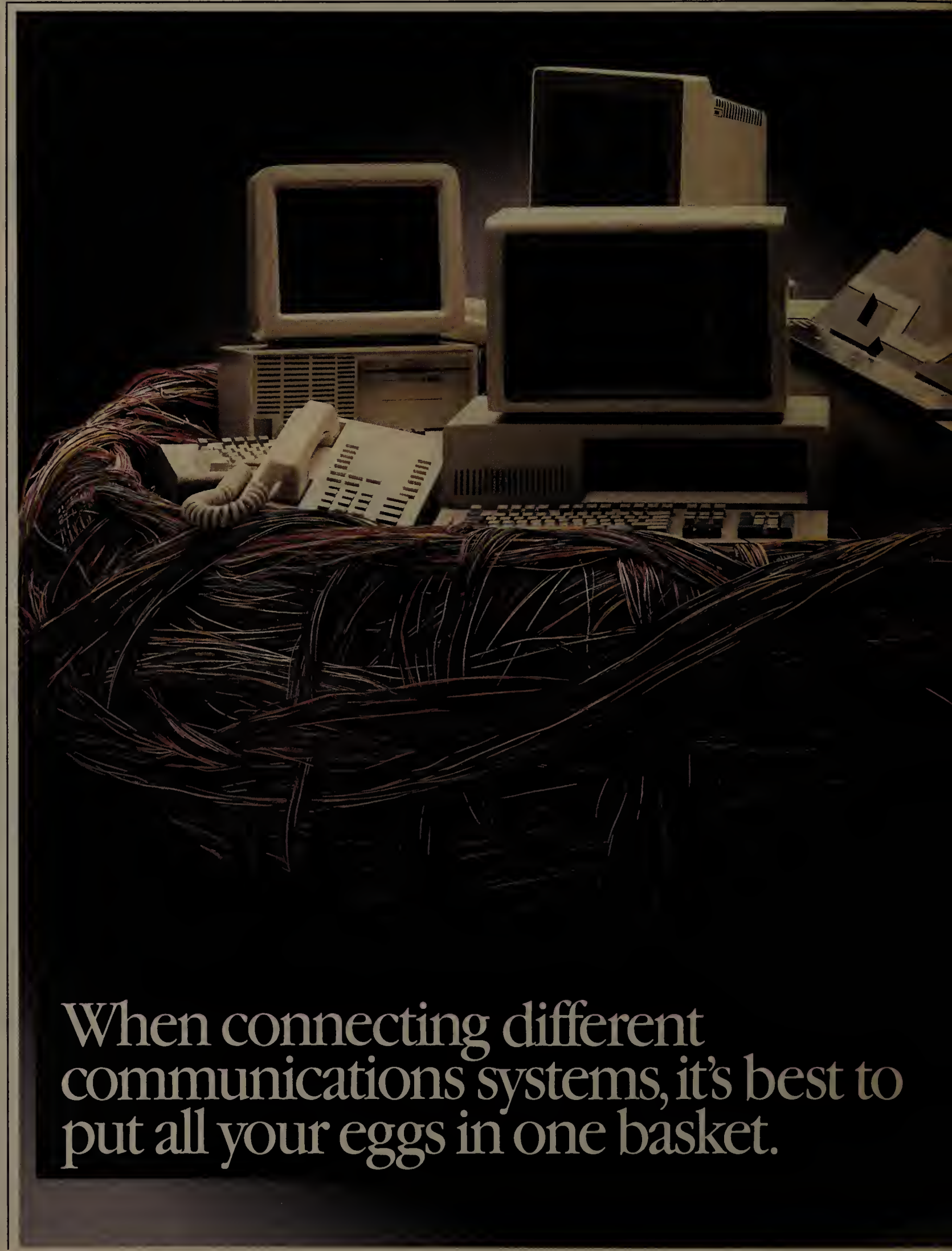
curity concerns, and data security officers will have to provide adequate safeguards despite the weaknesses of individual network components.

Network developers and integrators, as well as auditors and data security officers, must be cognizant of all the different vendor components in the organization's network; they must also understand the security capabilities and the vulnerabilities of each component.

A high-level network chart, annotated or color-coded to differentiate separate vendors' hardware and software components, is a good first step in this process.

Specific strengths, weaknesses or special points of concern can be

One system with an override feature was designed to limit access to sensitive information. Unfortunately, users could call up the override screen from the main menu and give themselves access at any time.



When connecting different communications systems, it's best to put all your eggs in one basket.

added later on.

Compatibility

Even in single-vendor networks, compatibility of components is a significant concern. With many vendors represented, compatibility is of paramount importance, not only for security, but for the successful operation of the network.

The widespread adoption of standard communications protocols has made it possible for multi-vendor networks to communicate smoothly. Data can migrate from Machine No. 1 of Type A to Machine No. 73 of Type Z quickly and effectively. The data on Machine 1 might be very sensitive and highly protected. However, the protection capability of Machine 73 might not

match that of Machine 1.

For example, if Machine 1 was an IBM 3081 running MVS/XA and using Top Secret, the sensitive data could be protected by having a security administrator define

which users have exactly what type of access to the specific data, and where and when.

If Machine 73 was a Tandem Computers, Inc. machine, none of that detailed Top Secret security

Compatibility of components is a significant concern. With many vendors represented, compatibility is of paramount importance, not only for security, but for the successful operation of the network.

would migrate with the data.

Security software designed to run on an IBM mainframe simply will not protect items on a host computer from Tandem, Stratus Computer, Inc., Digital Equipment Corp. or Data General Corp. And the security controls implemented on a non-IBM front-end computer or transaction processor, more than likely, will not be available back on the mainframe. The data security officer has to know what controls will work where and which ones can be replicated on different devices.

The security built into applications must also be considered in this context. If an IBM mainframe has RACF, ACF2 or Top Secret running on it, the controls in that package might be preferable to the security capabilities built into production applications. But the application-level security might be an integral part of the product — impossible to strip out, circumvent, ignore or substitute for.

Data security officers must investigate the compatibility of different security components of the network to ensure that what they want to do to implement protection and control can be done effectively and efficiently and without invali-

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AT&T's PDS is a comprehensive system of basic components, from inside wire (both copper and fiber), to electronic apparatus and support services.

Data security officers must investigate the compatibility of different security components of the network to ensure that what they want to do to implement protection can be done effectively.

dating any hardware or software maintenance contracts.

Finally, to assess compatibility, the data security officer must answer a few questions. Do the security controls in a purchased application replicate the existing controls provided by ACF2, RACF and Top Secret? Can the application controls be disabled in favor of the security software package? Does the maintenance contract with the application vendor allow code modification to branch around existing security?

Security domains

The concept of security domains relates to both vendor philosophy and compatibility. Ideally, all elements of a network reside in the same security domain — protected by the same set of controls, subject to the same rules, experiencing a

Continued on next page

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similar degree of protection at any point in the network. In a multi-vendor network, however, there are several security domains, each with a different span of control, and each with a different degree and method of protection.

Once data is moved from one security domain to another, it loses

negotiated. Project managers have been known to eliminate perfectly viable elements of a system's security because those elements can complicate system use downstream — in a separate security domain. Such actions make a system not just user-friendly but abuser-friendly and invite access-control problems.

Every additional security control proposed is viewed by at least one segment of the user population as another bureaucratic roadblock set up between them and the successful completion of their jobs.

the protection afforded by the first domain unless the new one has some mechanism for recognizing indicators of data sensitivity and implementing similar controls.

Data moving within such a network can be compromised in a relatively unprotected domain.

The data security officer must understand that different security domains exist within a multivendor network and be able to gauge the relative strengths and weaknesses of each.

Recognition of the existence and relative strength of security domains can help in decisions about how to route sensitive data through the network. Sensitivity indicators should also be part of the data traversing the network, so that available controls can be utilized. Such indicators must be added in the native domain by the application before the data enters the network. This may mean modifying the application so it can identify and tag sensitive data.

Multiple vendors, controls

The issue of security vs. productivity is a recurrent theme in multivendor networks. Every additional security control proposed is viewed by at least one segment of the user population as another bureaucratic roadblock set up between them and the successful completion of their jobs.

A common scenario confronting a prospective user in a multivendor network environment is a series of menu screens, several of which require unique IDs and passwords.

Before doing any productive work, a user might have to supply three or four separate IDs, in the correct sequence and tied to the current password. Yellow Post-It™ pads are consumed in great numbers in these areas. Live IDs and passwords can usually be found stuck to a number of terminals. Managers of these areas will tell the auditors that security is a good thing as long as it does not get in the way.

In a multivendor network with a variety of gateways, protocol converters and packet formats, there are enough natural hazards to be

Applications support groups will usually entertain security's request for common IDs and passwords as long as it's the other applications that must change their code and standards. Sometimes, an application cannot be modified to accommodate a generalized password scheme because of contracts that stipulate that any changes to

Project managers have been known to eliminate perfectly viable elements of a system's security because those elements can complicate system use downstream — in a separate security domain.

system code invalidate maintenance agreements.

Even if a unified ID/password standard can be agreed upon, installation of such a system requires the construction of several interface mechanisms to facilitate migration between applications. And even if these interfaces can be built, company politics rather than actual operational needs will usually determine which, if any, get implemented.

Even so, the elimination of tedious delays and potential confusion for users, as well as reductions in redundancy and increases in long-term user satisfaction, make the implementation of a unified ID/password system worth all the hassles.

The long-term benefits of such a system far outweigh all of these initial drawbacks, and data security officers are better off biting the bullet and making it work.

The data security officer must not lose sight of one important reality — if security controls interfere with the ability of users to do their job, they will find a way around those controls.

User tolerance

On the other side of the coin, unyielding demands from inflexible

security officers for increasingly burdensome layers of control can make a system user antagonistic. In the area of user tolerance the data security officer must:

■ **Educate the user.** A comprehensive security awareness program is an excellent way to accomplish this. Users must be told why security is necessary and why its implementation follows the path laid out in that organization.

■ **Be realistic about sign-ons, IDs and passwords.** Although 10-digit, randomly generated, alphanumeric passwords are indeed very secure, humans will not remember them. And the security vanishes when IDs and passwords are stuck on terminals. Password-change intervals must also be sensible. As a general rule, they should be changed every 30 to 90 days. If a password never changes, you might as well publish it or eliminate the control.

■ **Get application groups communicating.** Set up a meeting with key representatives of each corporate department. Once their support is gained, their users will be more likely to adhere to any companywide guidelines that are developed.

■ **Publish security error messages.** To help clarify the environ-

hold on productivity.

■ **Analyze the exposures.** In analyzing individual security domains and control structures, don't lose sight of the big picture. Allowing unrestricted access to a seemingly innocuous area can open the door to a much more sensitive area.

On the flip side, adding a simple control to close a minor exposure can have disastrous effects on downstream productivity. Before a control is implemented, its effects must be researched and understood throughout the network, not just in the domain of installation.

■ **Understand the political realities.** No matter how just, sensible, necessary or technically elegant a particular set of controls seems, it might not be acceptable in a specific environment. Alienating powerful department managers, skilled network technicians or front-line users does very little to enhance the reputation of the auditor or the data security officer and can also lower the chance for success of the network security program. Don't consciously try to buck the power structure, but...

■ **Hold your ground on security.** Empathizing with users does not include dereliction of duty. Users must also empathize with the security group. Firmness and resolve in maintaining security are as important as tact in implementing controls.

A complex multivendor network is a tool to help the organization achieve its real objectives, usually measured in terms of market share, widgets produced or dollars on the bottom line. Security is not an end in itself. Data security organizations are chartered to protect networks, programs, data and the associated processing capability to assure continuity of business.

Data security officers must comprehend the objectives of the organization and focus on protecting the elements most crucial to achievement of these objectives.

In short, realize the complexity of the task. Analyze security in this environment one thing at a time, then put it all together into a big picture. After seeing where the vulnerability is, get down into the details. Try to make things as sim-

The data security officer must not lose sight of one important reality — if security controls interfere with the ability of users to do their job, they will find a way around those controls.

They know what their job requirements are and what needs to be protected. If the data security officer has adequately explained the need for security, the constraints and the basic mechanics for implementing controls, users can give pointed, relevant and creative ideas for maintaining adequate security without putting a strangle-

ple as possible for end users while maintaining as much security as necessary.

While none of the items discussed here is especially new or radical, they must all be considered by the person responsible for implementing and administering security in a nonhomogeneous network. □

► **PRODUCT REVIEW**

Multilingual networking

Stand-alone protocol converters offer multiple communications links.

BY JOHN J. HUNTER

Contributing Writer

Providing effective, low-cost communications for a diverse mix of mainframes and terminals is a big headache for network managers.

The conventional method is to give each terminal its own communications link or to employ protocol converters. Either can be an expensive proposition.

The Jupiter Technology, Inc. System 1000 and Tri-Data, Inc.'s Netway LTN offer alternatives. Both allow a single terminal to converse simultaneously with multiple hosts. Terminals can either be locally attached to the 1000 or Netway LTN or users can dial into them. They differ, however, in system architecture, the number of simultaneous applications permitted per user and protocol conversion services provided.

Netway LTN uses a physically distributed architecture, in which terminal devices interface with stand-alone terminal handlers called Device Interface Processors. These furnish terminal management and protocol conversion services. Their output is fed into a nodal processor, which provides networking functions, switching and host-processor interaction.

The System 1000, on the other hand, uses a central processor unit — Jupiter calls it a data communications computer — to handle terminal interfacing, protocol conversion and terminal and host switching. The actual protocol conversion services are distributed within the central processor and are shared by all terminals.

Netway

The Netway LTN comprises four basic components: Model 1004 or 1044 Device Interface Processors for interfacing terminals; printers or point-to-point host ports to the network; the Model 1500 Nodal Processor; and a Hub unit. The Hub interfaces 1004 and 1044s with the 1500 or can be used to link 1500s together in a network configuration.

The 1004 and 1044 are tabletop or rack-mounted units. Each has its own 6-MHz microprocessor, 512K bytes of memory, four serial I/O ports and one port for connecting directly to the Model 1500 or to the Hub. The major difference between the Interface Processors is in the types of devices attachable. The 1004 provides a coaxial-A interface for IBM 3278 terminals and 3287 printers, while the 1044 furnishes an RS-232-C interface for terminals, printers and point-to-point hosts.

Hunter is president of TMS Corp., a marketing management consulting firm in Devon, Pa.

The Model 1500 Nodal Processor is the central component in the network and is offered in two versions: N1500 and N1500/20. The only difference between them is that the N1500/20 has a built-in 20M-byte Winchester hard disk, while the N1500 has a 3½-inch microfloppy. Both processors are tabletop units, handle all networking functions, provide host processor communications and perform all communications switching between terminals and host processors. The disk/diskette is used for storing network configuration information, terminal personalities, protocols and the Nodal Processor operating system.

Both Nodal Processors contain an 8-MHz processor, 512K bytes of memory and four serial data communications ports for host processor connections or for linking Hubs or other Model 1500s. Maximum

in the 1004 and 1044 provide a high degree of processing ability. The memory in each contains the software for controlling each node and also handles the terminal personality and protocol conversion software that is downloaded from the Model 1500.

Each Interface Processor can be configured to work with four of the following protocol converters: IBM Systems Network Architecture/Synchronous Data Link Control, Binary Synchronous Communications, Honeywell, Inc.'s VIP, Burroughs Corp.'s Poll-Select, Sperry Univac Minicomputer Operations' UTS, Digital Equipment Corp. and Data General Corp. asynchronous, Hewlett-Packard Co.'s ENQ-ACK, IPARS, SABRE and X.25 Level II and X.25 BSC. The protocol suites are not standard equipment. Each must be purchased separately. This is also the

sion of the Unix operating system. The central processor also includes peripheral controllers for handling up to 70M-bytes of internal Winchester disk storage on Models 3 and 7, and up to 140M bytes on the Model 14. The microprocessors and peripheral controller attach to a 26M bit/sec VME bus that also connects the IOPs.

Up to two, six or 13 IOPs can be configured on the Models 3, 7 and 14, respectively. Each has its own microprocessor and from 500K to 1M bytes of random-access memory for interacting with communications interface boards and storing protocols downloaded from the central processor. Protocols supported are asynchronous, IBM 3270/S, 3270/M, BSC 3270/3274 asynchronous emulator, SNA 3277, BSC 3270 Switch, SNA 3777, SNA 3270-3274 emulation, SNA/SDLC, 2780/3780 BSC, X.25, multihost ASCII, Wang Laboratories, Inc. WPS (store and forward) and Ethernet.

The System 1000 communications interface boards perform the physical and electrical interfacing of terminals and support bit and byte serial protocols including SNA/SDLC, BSC, High Level Data Link Control and X.25 Level II. Physical interfaces are RS-232-C, -422, -423 and CCITT V.35. Up to 12 communications processor boards can be linked to each IOP. Again depending on the central processor version, 96, 384 or 624 lines can be accommodated. A communications processor board is also offered for linking Ethernet IEEE 803.3 with an Ethernet IOP to form a network bridge.

According to Jupiter, IOPs can be linked through the VME bus to share services among the communications interface boards. Thus, users with multiple types of terminals at one location can use one interface board to have a multiplicity of protocol services performed. The IOP link-up is handled by the system administrator using a network-definition language. By contrast, Tri-Data claims that a single protocol converter or an entire suite can be changed dynamically within the 1004 or 1044 to meet application needs by merely downloading the required software.

The sum of the parts

In summary, both products are fairly even in terms of the services furnished, but the System 1000 does everything with less hardware. Jupiter's protocol-sharing method could give it an edge in that everything can be generated at system initialization time, as opposed to dynamic downloading. Of course, a lot of activity against a System 1000 protocol module might cause performance problems, unless multiple versions of the same protocol are generated. □

Two protocol conversion systems compared

	Vendor/Product	
	Jupiter Technology, Inc. Reston, Va./ System 1000	Tri-Data, Inc. Mountain View, Calif./ Netway Local Terminal Network
Maximum simultaneous users	624	18,000
Autonomous operation	✓	✓
Price	\$25K and up for System 3; \$40K and up for System 7; \$45K and up for System 14	\$1K per line based on system with 100 lines

SOURCE: TMS CORP., DEVON, PA.

host communications speeds are 19.2K bit/sec asynchronous or 56K bit/sec synchronous. The Model 1500s support internodal leased-line or X.25 connections and can be used as gateways to X.25 networks as well as to token-passing local-area networks.

The Hub contains 10 ports, nine of which are used to interface 1004s or 1044s to the 1500; the ports can also be used to link Model 1500s in a local terminal network configuration. Up to eight 1500s can make up a local terminal network, and up to five such networks can be linked. Hubs can be up to 2,000 ft from the 1500 or from another Hub.

The 1004 and 1044 can connect four physical devices and maintain eight logical connections. Any terminal connected to either unit can establish four concurrent sessions, with two sessions from different hosts displayed concurrently through split screens. Users can manipulate data on the screen and hotkey between sessions. The 1004 and 1044 have sufficient buffer storage for handling inputs from the host processor, even when the addressed session is suspended (not active on the screen). When a suspended session is activated, the data is automatically displayed.

The microprocessor and memory

case with the System 1000.

According to the vendor, terminal keyboards are mapped to permit all function keys to operate in native mode. The only exception is where the terminal being emulated has no corresponding key. A dumb ASCII terminal emulating an IBM 3278, for example, will require multiple keystrokes to emulate a function normally activated through a programmable function key.

Jupiter too

The Jupiter System 1000 also performs protocol conversion, terminal mapping and applications management, and according to the vendor, it permits an unlimited number of logical sessions per terminal user. The System 1000 uses a centralized architecture with all functions handled within one box but distributes the protocol-handling services among a series of internal modules called I/O Processors (IOPs).

The System 1000 central processor is offered in three versions: Models 3, 7 and 14. Model 3 can contain up to three Motorola, Inc. MC 68000 microprocessors, while Models 7 and 14 can be configured with up to seven or 14 microprocessors, respectively. The microprocessors run a real-time ver-

Toyota links U.S., Japan

continued from page 4

The Torrance PBX, which has been in place since 1982, currently has 1,600 lines, although the SL-1 XT is capable of managing up to 5,000 lines. Torrance uses a combination of US Sprint Communications Co. WATS service and AT&T 800 service for voice and data communications.

The Georgetown plant will begin operation with 500 lines and could eventually expand to 3,000, according to Michael Clark, the BellSouth Advanced Systems, Inc. account executive who sold the Georgetown SL-1 to Toyota.

BellSouth is Northern Telecom's distributor in Kentucky.

Facsimile transmission will play an important role

in Toyota's network. "Many of our international calls are facsimile," Rees said. "The Japanese are big on fax and rely on it heavily to communicate with the U.S. because of the time difference. You might not be able to reach someone by telephone because they're going home in the U.S. when the Japanese are just starting their day, but you can always send a memo by fax."

Peak calling times between the U.S. and Japan are between 3:30 p.m. and 5:30 p.m. Eastern Standard Time, which is between 8:30 a.m. and 10:30 a.m. the next day in Japan, Rees said. "While we may not always use all of the T-1 capacity we have, we want that capability for peak calling periods," he added.

The factory, which will produce the Toyota Camry, is expected to open next

year and will employ 3,000 workers. The complex will consist of a large factory building, an administrative center and a training center. Broadband cable will be used throughout for data and video communications, said Roy Vasher, information systems manager at Toyota Motor Corp. The in-house video system will be used for employee training and announcements.

South Central Telephone Co. will support the Georgetown Toyota factory by installing a five-mile fiber-optic link, according to Renee Schlatter, the account executive working on the Toyota project. "Toyota wanted a high-capacity, end-to-end digital connection, and our fiber-optic trunk and digital central offices allowed us to meet those demands," she said.

Toyota relies almost ex-

clusively on IBM computers throughout its U.S. and Japanese facilities. IBM host computers run both manufacturing and administrative facilities here and abroad. Consequently, "we're a totally SNA shop," Rees said. "We don't anticipate installing any local-area networks in Torrance because our host systems are capable of handling the shared applications users need."

Next year, the George-

town operation will probably install a facilitieswide local net. Given the heavy reliance upon IBM gear, a Token-Ring Network is a likely choice, Vasher said, although no decision on the net has been made yet. The Toyota factory in Kentucky will use IBM 4381 host computers and a variety of terminals and Personal Computers such as the Personal System/2. Torrance uses IBM 3090 and 3081 hosts. □

CORRECTION:

The ending of the story "HP Bites Connectivity Bullet," (NW, Aug. 17) was omitted due to a production error. The remaining text is printed below as it should have appeared. Network World regrets any inconvenience this error may have caused.

"We're as open as we dare to be," says Willem Roelandts, general manager of Hewlett-Packard's Information Networks Group. "From a protocol point of view, we are extremely open. Openness is limited if you want to access internal layers or interfaces. With internal interfaces, the danger is that the next generation of our software will not be compatible," he

says. "We want to be as open as possible, but we also want to protect the customer's investment."

In terms of across-the-board support for standards, Gartner's [Vince] Barrett says HP is "if not the front of the pack, very close to the front." Unlike some vendors who have stated their commitment but have done little to develop standards-based products, HP has "put its development money and efforts where its mouth is," Barrett says.

"They're certainly ahead of DEC," he continues. "They're much more committed in terms of deliverable functionality and willingness to state what their development plans are."

Roelandts says he believes that having begun the migration to standards early on — when HP's installed base of minicomputers was relatively small — the company will in time have a strategic advantage over its competitors. "If you have a big installed base and you're pretty successful, it's difficult to move to a new architecture," he says, referring to IBM and DEC.

"If you look back historically, the companies that were leaders in vacuum tubes were nowhere in transistors," Roelandts says. "The more these vendors perpetuate their proprietary protocols, the better it will be in the long term for Hewlett-Packard." □

Letters:

Editor:

I would like to take this opportunity to compliment Byron Belitsos on his fine assessment of packet-switching services ("Regulatory storm jolts VANs," NW, June 22). However, in the article, I was quoted as saying, "Northwestern Bell has just received federal tariff approvals for an inter-LATA service via Western Union Corp." This needs clarification.

The Digipac switching service, to which Belitsos refers, is offered via all three US West, Inc. companies: Mountain Bell, Northwestern Bell and Pacific Northwest Bell.

Also, while each respective US West company may provide this interstate, public packet-switched, network access service to any customer within a local access and transport area, I must stress that this is an interstate service, not an inter-LATA offering. Further, the local telephone company doesn't provide the inter-LATA services, only the means to access a carrier.

During the Institute of Electrical and Electronics Engineers' International Switching Symposium held last March in Phoenix, Western Union was connected between the Mountain Bell Digipac nodes in Phoenix and Denver. The company tested the capabilities and operation of the X.75 prime protocol while transporting traffic from the Integrated Services Digital Network terminals in Phoenix to Denver.

This neither constitutes an inter-LATA offering of the US West companies nor any type of a joint offering or ven-

ture between these companies and Western Union.

We consider Western Union, as well as other value-added network service providers, to be valued customers, and when they offer a service using our tariffed network, we don't view this as a joint venture.

Belitsos' article was excellent and, except for the possible misunderstanding of our Digipac service offering, exceedingly timely and accurate.

Ronald J. Dibelka
Product manager
of Digipac
Northwestern Bell

Editor:

In the July 27 issue of *Network World*, there were two separate references stating that VMX, Inc. is the first and only company with the capability to convert electronic mail messages to synthesized voice messages.

This is incorrect, as Zymacom's Information Exchange also has this capability.

The first incorrect reference appeared in the story, "VMX gives electronic mail a voice."

The second reference appeared in the voice-messaging product focus, "Voice messages: speech-efficient."

Interestingly, John Hunter's product review of July 13, "The telephone tag alternative," was correct. It says VMX's "5000 series is one of only two systems (Zymacom's Information Exchange is the other) that can convert text messages to voice."

Joseph J. Scozzafava
Vice-president
Marketing
Zymacom, Inc.
Westford, Mass.

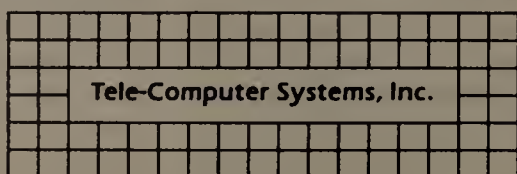
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1 My primary areas of activity. (Circle ONE only)

I am involved in evaluating communications (data, voice and/or image) products and services:

1. for use *within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) _____

For communications, my primary responsibility is: (Circle ONE only)

1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) _____

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of
Finance, Admin. Procurement
Communications Management
Data Communications

21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks,
Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
Supervisor, Head: Networking, Design, Analysis, Engineering, R&D,
Applications, Services
- Telecommunications*
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks.
Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering,
R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development,
Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3 Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

A Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

Check ALL that apply in columns A and B.

- A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

- B. These products and services are presently in use at this location:

A	B	Product/Services	A	B	Product/Services
Computers			Transmission/Network Services Equipment		
01.	<input type="checkbox"/>	Micros	18.	<input type="checkbox"/>	Microwave
02.	<input type="checkbox"/>	Minis	19.	<input type="checkbox"/>	Satellite Earth Stations
03.	<input type="checkbox"/>	Mainframes	20.	<input type="checkbox"/>	Local Area Networks
34.	<input type="checkbox"/>	Printers	21.	<input type="checkbox"/>	Wide Area Networks
Data Communications			22.	<input type="checkbox"/>	Packet Switching Equipment
04.	<input type="checkbox"/>	Communications Processors	23.	<input type="checkbox"/>	Fiber Optic Equipment
05.	<input type="checkbox"/>	Comm./Networks Software	36.	<input type="checkbox"/>	T1
06.	<input type="checkbox"/>	Digital Switching Equipment	Communications Services		
07.	<input type="checkbox"/>	Facsimile	24.	<input type="checkbox"/>	Packet Switching Services
08.	<input type="checkbox"/>	Modems	25.	<input type="checkbox"/>	Cellular Mobile Radio Services
09.	<input type="checkbox"/>	Multiplexers	26.	<input type="checkbox"/>	Electronic Mail
10.	<input type="checkbox"/>	Protocol Converters	27.	<input type="checkbox"/>	Enhanced Services
11.	<input type="checkbox"/>	Network Mgmt. & Control	28.	<input type="checkbox"/>	Centrex
12.	<input type="checkbox"/>	Test Equipment	29.	<input type="checkbox"/>	Long Haul Services
13.	<input type="checkbox"/>	3270 Controllers	30.	<input type="checkbox"/>	BOC Services
35.	<input type="checkbox"/>	Intelligent Terminals	31.	<input type="checkbox"/>	Independent Telco Services
Telecommunications			Other		
14.	<input type="checkbox"/>	PBXs	32.	<input type="checkbox"/>	Factory Communications
15.	<input type="checkbox"/>	Key Systems	33.	<input type="checkbox"/>	Online Data Bases
16.	<input type="checkbox"/>	Central Office Equipment			
17.	<input type="checkbox"/>	Integrated Voice/Data Terminals			

7 Estimated value of communications systems, equipment and services:

- A. which you helped specify, recommend or approve in last 12 months?
(Check only ONE in column A.)
- B. which you plan to specify, recommend or approve in next 12 months?
(Check only ONE in column B.)

- | A | B | A | B |
|--|-----------------------------|--|-----------------------|
| 1. <input type="checkbox"/> <input type="checkbox"/> | \$10 million and over | 6. <input type="checkbox"/> <input type="checkbox"/> | \$100,000 - \$249,999 |
| 2. <input type="checkbox"/> <input type="checkbox"/> | \$5 million - \$9.9 million | 7. <input type="checkbox"/> <input type="checkbox"/> | \$50,000 - \$99,999 |
| 3. <input type="checkbox"/> <input type="checkbox"/> | \$1 million - \$4.9 million | 8. <input type="checkbox"/> <input type="checkbox"/> | Under \$50,000 |
| 4. <input type="checkbox"/> <input type="checkbox"/> | \$500,000 - \$999,999 | 9. <input type="checkbox"/> <input type="checkbox"/> | Don't Know |
| 5. <input type="checkbox"/> <input type="checkbox"/> | \$250,000 - \$499,999 | | |

Estimated gross annual revenues for your entire company/institution:

(Circle ONE only)

1. Over \$1 billion
2. \$500 million to \$1 billion
3. \$100 million to \$499.9 million
4. \$50 million to \$99.9 million
5. \$10 million to \$49.9 million
6. \$5 million to \$9.9 million
7. under \$5 million

Estimated number of total employees at this location:

(Circle ONE only)

- | | | | |
|------------------|--------------|--------------|------------|
| 1. Over 5,000 | 3. 500 - 999 | 5. 100 - 249 | 7. 20 - 49 |
| 2. 1,000 - 4,999 | 4. 250 - 499 | 6. 50 - 99 | 8. 1 - 19 |

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Thursday, September 17th at 11am at earth station site, 3901 E. 78th St., Kansas City, MO. Inspect earth station and CTO, Wednesday, September 16th from 9am to 4pm.



CTO's are located at the Bryant Building, 1102 Grand Ave., 4th & 22nd Floors, in Kansas City, and at the Valley Building, 900 Walnut St. in St. Louis, MO.

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Friday, September 18th at 3pm at earth station site, 28500 Pettibone Rd., Solon, (Glenwillow), OH. Inspect earth station and CTO's, Thursday, September 17th from 9am to 4pm.

CTO's are located at the Keith Building, 1621 Euclid Ave., Cleveland and at the Henry W. Oliver Building, 535 Smithfield St. in Pittsburgh, PA.

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Sale 5

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* All real property is located at each earth station site.

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computer/net

Networks cure hospital ills

continued from page 1

mium in the case of nonprofit hospitals. Now, hospitals are reimbursed according to a fixed schedule for every procedure, regardless of their expense in delivering the medical care.

"The 1983 legislation had an enormous effect on the industry," said John Girton, vice-president of research at Birr, Wilson & Co., a San Francisco investment research firm.

"Several smaller hospital chains have filed for Chapter 11," Girton said.

The legislation has led to a syndrome that Dave McFadden, a spokesman for Nashville-based Hospital Corp. of America, a health care organization, describes as "quicker and sicker." Patients entering hospitals come in sicker and are sent home more quickly than they were in the past, he explained.

Hospitals like to treat patients on an outpatient basis, which is less expensive, and discharge patients as quickly as possible to hold down expenses.

The result is that the average hospital occupancy rate has dropped from 70% to as low as 50% in some areas of the country, according to McFadden.

While hospitals first turned to more traditional cost-paring measures in the face of declining revenues, they have since been forced to look for more innovative means of reducing costs and improving service.

Mick Taylor, a spokesman for American Medical International, Inc., a Beverly Hills, Calif.-based hospital chain said, "You can only cut costs so much and lay off so many people before service begins

to suffer." Because hospitals are information-intensive, Taylor said, the industry has turned to more efficient information processing and communications systems as a means of providing better and lower priced health care services.

American Medical International recently appointed a chief information officer, an appointment that Taylor said is a clear indication of the company's recognition of the strategic importance of information systems and communications.

Humana, Inc., a Louisville, Ky.-based health care provider with more than 80 hospitals throughout the country and overseas, exemplifies health care industry efforts to put network technology to strategic advantage.

Humana has established an automated order-entry system with its hospital product suppliers. The health care company is eligible for discounts because the system reduces the cost involved in paper transactions, according to Fred Pirman, senior vice-president for information systems at Humana. "We made it a condition of doing business with our suppliers," he said.

The automated ordering system enabled the company to impose supply-order standards for its hospitals throughout the country, thereby making the company eligible for additional volume discounts.

Humana also has set up electronic links to many of the insurance companies that provide payments for patients, thereby expediting the payment process, Pirman said. "All of our billing and collection information is sent to our central data center and is then communicated to the payers," he said.

Information is sent to suppliers

and insurance companies every night in batch files over dial-up telephone lines using IBM's 2780 remote job entry protocol.

The health care provider also hopes to make it possible to update patient records at the point of service, enabling on-line entry of patient information at check-in and record updating throughout the hospital in operating rooms, laboratories and even at patients' bedsides.

Automating the patient information system will increase productivity for hospital personnel, said Pirman, who estimated that 40% of nurses' work time is spent updating patient information files.

Electronic communications of patient information will also provide more efficient treatment of patients, according to Pirman. "A patient may be prescribed medication to take every two hours," he said. "If paperwork is delayed and doesn't get to the pharmacy on time, the delay could affect the results of tests based on the patient taking the prescribed medication." Humana plans to have a prototype of the patient information system in place at one of its Louisville hospitals by next summer.

Humana also has plans to link doctors electronically to its network. Today, doctors have to visit the hospital to check patients' medical charts and alter patient treatment. In the future, physicians will be able to access patient records and prescribe treatment remotely using terminals in their offices, Pirman said.

The electronic connection to the hospitals will encourage doctors to use Humana's facilities by saving them time and trouble.

"We are not technology-driven," Pirman said. "It is not new technology but new applications that we are using." □

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Sept. 1-3, Dallas — Intermediate Data Communications. Contact: The International Communications Association, Suite 710, 12750 Merit Drive, Dallas, Texas 75251.

Sept. 11, Minneapolis — The Future of Telecommunications Competition and Regulation: What's in the Public Interest? Contact: Patty Manske, The Humphrey Institute, Suite 235, 301 19th Ave. S., Minneapolis, Minn. 55455.

Sept. 15-17, Dallas — ICC-ISDN '87: Evolving to ISDN in North America. Contact: Jane Farthing, Bell Atlantic Network Services, 1310 N. Court House Road, Arlington, Va. 22201.

Sept. 16-18, San Francisco — SNA Architecture and Implementation. Also, Oct. 7-9, Boston. Contact: Communications Solutions, Inc., 2125 Hamilton Ave., San Jose, Calif. 95125.

Sept. 17-18, San Francisco — Satellite Technology: A Seminar for the Non-Technical Manager and Executive. Also Oct. 13-14, Washington, D.C. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Sept. 17-18, Atlanta — Understanding ISDN. Also, Oct. 19-20, Washington, D.C.; Nov. 9-10, New York. Nov. 19-20, Orlando, Fla. Contact: Telecommunications Research Associates, P.O. Box 1200, Newark, Ill. 60541.

Sept. 21-23, McLean, Va. — BOC Data Services Strategies Conference. Contact: Sharon Feinstein, TeleStrategies, Inc., Suite 100, 1355 Beverly Road, McLean, Va. 22101.

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MasterCard aims to buy Cirrus net

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MasterCard, based here, confirmed that talks are under way and said a sale may be in the offing. But, both concerns declined to divulge the value of MasterCard's offer and would not disclose the nature of the pending agreement.

Bank industry analysts have put MasterCard's offer at between \$35 million and \$38 million. MasterCard last year reportedly bid \$28 million for Cirrus. That bid was spurned last May when six of the 14 financial institutions that own Cirrus paid \$16 million to buy out the other eight.

Although the eight former owners were ready to close the deal with MasterCard before selling out to the other six banks — Bank of Montreal, BayBanks, Inc. of Boston, First Interstate Bancorp of Los Angeles, Mellon Bank Corp. of Pittsburgh, NBD Bancorp, Inc. of Detroit and Norwest Corp. of Minneapolis — the new owners balked. The current owners are looking for a better financial package before closing the deal, sources

say.

Because they would still be some of the largest net users following the sale, Cirrus' owners are reportedly concerned about changes MasterCard could make to the net.

"This is different than the sale of a corporation," said Henry Mundt, senior vice-president for marketing at Cirrus. "In many cases, when owners sell something, they can walk away from it. If an agreement is reached, the current owners, in this case, will still be Cirrus' major users."

The MasterCard offer follows the February accord between Visa of San Mateo, Calif., and Plus System of Denver. Under that agreement, Visa paid Plus System \$5 million and gained seven of 21 seats on Plus System's board of directors. The agreement also enabled Visa's member financial institutions to join Plus System for \$50,000, instead of the standard \$100,000 fee. According to a Visa spokesman, the agreement ended Plus System's practice of limiting membership to one financial institution in a given geographical area.

A MasterCard spokesman said it is unlikely any agreement with

Cirrus would mirror the Visa/Plus System accord. A Cirrus spokesman, however, said that type of agreement has not been ruled out.

Some bankers favor the Visa approach over a total buyout of Cirrus, saying it would be less expensive for the 29,000 financial institutions that own MasterCard.

A merger would place Cirrus' 60 million cardholders, 17,200 ATMs, 3,031 member financial institutions and 1.4 million monthly transactions under MasterCard's umbrella. MasterCard's 3-year-old MasterTeller network, which enables MasterCard holders to obtain cash advances against their credit accounts, currently consists of 9,462 ATMs and 806 financial institution members. It serves 47 million MasterCard holders. MasterTeller would not reveal its transaction levels.

More locations will benefit customers and increase network transactions, said Marc Rudov, president of Telematics Resource Group in Wellesley, Mass., and author of a recent ATM study. "Cirrus has many more ATMs than MasterTeller. That is all the customer cares about — being able to

get money from more locations."

The 850 members of Visa's ATM net support 19,023 ATMs in 21 countries, enabling 150 million Visa cardholders to obtain cash advances. The investment in Plus System gives the 19,017 financial institutions that own Visa the option of joining the Plus System net.

Plus System, comprising 2,000 members, currently has 70 million cardholders, 15,000 ATMs in three countries and processes 1.4 million transactions per month. The Visa/Plus System agreement has already added 600 Plus System locations to the Visa ATM network.

By aligning with ATM networks, Visa and MasterCard will also benefit from the expected increase in POS transactions.

Due to MasterCard and Visa's venture to jointly market the Entree debit card, it is unlikely either firm will unveil a new debit card product. However, a joint venture with a national ATM network would give the credit card giants the fuel to sign on retailers to accept Cirrus or Plus System ATM cards in addition to MasterCard and Visa credit cards over existing POS networks. □

LAN vendors vary in ISO support

continued from page 1

similar makes and types of computers to interoperate as easily as components of a stereo system.

The framework the industry is building to is ISO's network architecture, called the Open Systems Interconnect (OSI) network model. ISO has designed the model with seven layers of protocols and specified the relationship between these layers.

For many layers, however, ISO has created several different options. The transport level, or Layer 4 of the OSI model, for example, includes four classes of protocols.

As a result, vendors can implement different options, rendering different implementations incompatible. The Manufacturing Automation Protocol promulgated by General Motors Corp. for factory automation specifies use of certain options available within each layer to obviate that concern. MAP specifies a suite of ISO protocols, a protocol stack.

Ungermann-Bass, Inc., having shipped its first products based on MAP in April 1985, leads the personal computer and terminal network vendors in OSI product development. Few other local net vendors have taken as aggressive a stance as Ungermann-Bass. Most are waiting for greater market demand for OSI-compatible products.

Bridge Communications, Inc. and Micom-Interlan, Inc. plan to introduce OSI-compatible products before year end, and such companies as Excelan, Inc., Sytek, Inc. and 3Com Corp. are looking to 1988 to debut such products. Novell, Inc. has just hired someone to focus on OSI and is making no commitment as to when the company might deliver products.

Ungermann-Bass, Bridge and Micom-Interlan say they are aiming

to be leaders in OSI networking. Ungermann-Bass is now beta testing its MAP 2.1 protocol suite on its Net/One local network, according to Joe Schoendorf, executive vice-president of Ungermann-Bass and president and chief executive officer of Industrial Networking Inc. (INI). INI is jointly owned by Ungermann-Bass and General Electric Co.

"We have working OSI networks and thousands of hours of test data from real systems," Schoendorf said. "MAP and TOP will be the two commonly used standards in the late 1980s and early 1990s."

Bridge plans to roll out its first OSI product this fall, said Judith Estrin, executive vice-president. The TOP-compatible software product will run on servers and support all seven OSI layers.

Bridge has several years experience with OSI and has shipped an ISO protocol stack including Layers 1 through 4 to a customer in France, Estrin said.

Like Bridge, Excelan and Sytek, Micom-Interlan is looking to introduce OSI support through software upgrades, a capability made possible by the network model's layers. "Our game plan is not to have the customer change the network board," said Mike Barker, president of Micom-Interlan.

While Ungermann-Bass and Bridge have developed their own OSI implementations, Micom-Interlan purchased the protocols in the form of software from Retix.

Using Retix's source code, Micom-Interlan developed and is offering OSI transport-level protocols with an interface to IBM's Network Basic I/O System, said Ken Guy, vice-president of product strategy for Micom Systems, Inc. This interface means software ap-

plications that support NETBIOS will be able to run over networks using Micom-Interlan's transport protocols.

Micom-Interlan plans to bring out several more products that build on the OSI transport layer (Class 4) late this year, Guy said. One product will enable Unix System V Release 3-based systems to be used with a variety of different networks, independent of underlying protocols. The company will support a similar capability for Berkeley Unix 4.2.

Micom-Interlan also plans to offer a transport layer interface to MS-DOS in the first quarter of 1988, enabling users of Unix and DOS machines to transfer files, as well as develop network applications that can access files at the record level, Guy said.

On a slightly different tack, Excelan and Sytek both want to support multiple protocols, such as MAP and TOP, and de facto standards such as the Department of Defense's Transmission Control Protocol/Internet Protocol.

Sytek expects to support OSI protocols in software on communication servers and routers by 1988, said Phil Edholm, director of product marketing.

Like other networking vendors, Sytek is not rushing into the OSI market. "For LAN vendors, the pressure will come when the computer vendors begin to offer OSI products," Edholm said.

Among the personal computer networking vendors, Banyan Systems, Inc. and 3Com appear to have the most serious commitment to ISO support. "Banyan expects to use ISO as the primary means of information exchange," said Mary Kirson, director of product marketing. This means using OSI-compatible protocols in its network operating system to support communications between servers,

network workstations and host computers, said Larry Floryan, director of system design.

The company is now in the midst of replacing its proprietary protocols at its network layer with OSI protocols, Floryan said.

Since the ISO specification lacks certain functionality, such as automatic addressing, Banyan "will add to those protocols where it makes sense to enhance them," Floryan said. Over the next 18 months, Banyan expects to convert its proprietary middle-layer protocols, up through the fifth, or session layer, over to ISO protocols, he added. In the long term, the company will offer software that supports ISO protocols from Layers 3 through 7.

3Com will be supporting ISO protocols in the next major version of its network operating system, said Larry Birenbaum, vice-president of software engineering. 3+open, which will be based on Microsoft Corp.'s OS/2 and LAN Manager, will be out in the first half of 1988. "Our commitment is to the MAP/TOP 3.0 standard," Birenbaum said.

3Com will provide a protocol stack covering Layers 1 through 7, with File Transfer and Access Method and X.400, as well as its own file and print services on top of the protocol stack, Birenbaum said. The protocol suite will run on network servers and nodes. Like Banyan, 3Com will support ISO "as an intrinsic set of protocols. We're not using a gateway approach," he said.

Novell appears to be taking the most cautious view of OSI. "We're interested in doing things in the ISO area when it becomes popular," said Mark Calkins, director of corporate marketing and development. "You won't see Novell the first out on the street with an ISO product," he said. □

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